CADUCEUS

a museum quarterly
for the health sciences

Spring 1989

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Laurel Cazin. I Wear a Mask to Hide My Emotions, But Cannot Escape *(18" x 24" black-and-white photograph, courtesy of FORECAST Public Artspace Productions).*

FROM THE EDITOR

"...The importance of eyesight is reflected in our language: to have a view-point *is to take a conceptual position;* to look into something *is to investigate it*, to see something *is to understand it."*[1] *(Maria Klein)*

In order to establish a common notion of reality, a process of communication is required whereby frames of reference are built upon common symbols for life's experiences. Our senses, particularly eyesight, are necessary to the process of gathering and evaluating information to establish perceptions of reality.

In 1976 the Rockefeller Foundation sponsored a symposium on the "healing role of the arts," convened to consider the roles of the arts in healing and therapeutic environments. As symposium organizer Michael Jon Spencer explained, the arts "direct a person inward, and in encouraging expression, help one to order and deal with feelings." In contrast, sports "can release repressed aggression--which is good and necessary, but people must also learn to control emotions in subtler ways. The people who function well in society can sublimate and integrate these energies to adapt to their environment. In this sense, the arts serve rehabilitative and habilitative goals." [2]

I was reminded of Spencer's argument when viewing the "Art of the Eye," a travelling exhibit conceived by Minneapolis sculptor Scott Nelson. The exhibit focuses on "the nature of perception by artists with vision impairments."[3] If there seems to be any paradox in Nelson's concept, writes Maria Klein in the catalogue preface, "it is only because so little information about vision impairment, including his, has been made available to...the 'normal-sighted' public."[4]

This lack of information often leads both "normal-sighted" and vision-impaired individuals to act from ignorance and misconceptions. Even ophthalmologists sometimes are at a loss to explain what effect eye diseases

will have on their patients' vision and on their perceptions of the world around them. As Budd Appleton, M.D., admits, "though we are highly trained and deeply experienced specialists, this confers no magical insight on us." The physician can discuss possible causes, treatment options, prognosis of disease and other clinical aspects with patients, but "a wide gulf separates us from them and unless we have experienced visual disability ourselves, we just *don't know how it feels*!"[5]

Because we don't know how it feels, we, as a society, are just beginning to learn how ignorance relegates both the impaired unnecessarily to the periphery of society and the "normal" unintentionally to prejudice and misconception. Artifacts of the healer are reminders of the great progress technology has provided in understanding causes, treatment options and prognosis. The exhibition of artifacts--the appropriate media of museums--allows viewers to place contemporary clinical procedures in context. The exhibition of artifacts, however, does not let us know how it feels to be impaired, whatever the cause. Unless providers can communicate a common frame of reference with their patients, no matter how exotic the technology, health care professionals will continue to be singled out for their unintentional prejudices and misconceptions which relegate many who are impaired to the periphery of society, including access to health care services.

The wooden case of lenses, the eye examination chart, the ophthalmoscope are artifacts of the history of diagnosing and treating diseases of the eye. Ophthalmologic exhibits can demonstrate something of the healer's thought processes. But what of the perspectives of those impaired and/or diseased? The artists whose works are featured in the "Art of the Eye"--all visually impaired in some form--use artifacts of clinical ophthalmia to express their perceptions of the world. These artists use their ingenuity to express what it feels like to experience the world from their perspectives. Art, in this context, is both rehabilitative, and, for those who participate in its exhibition, habilitative.

This first issue of the fifth volume of *Caduceus* is focused on ophthalmology. We are grateful to Susan Cronenwett, Director of the Ophthalmic Heritage Department of the Foundation of the American Academy of Ophthalmology in San Francisco, for her assistance with contributors. Most scholars agree that no technological advancement has made more of an impact on eye treatment than use of the laser. In his feature, surgeon Francis L'Esperance traces the history of lasers, including such important developments as the clinical use of photocoagulation, a technique by which tissue is thickened through precisely focused, high energy light.

From a unique perspective, Frederick Blodi, M.D., presents some of the prominent figures in the history of ophthalmology through a display of commemorative postage stamps. Then Susan Cronenwett provides a focus on the new Ophthalmic Heritage Department of the Foundation of the American Academy of Ophthalmology. Those of you with a penchant for "artifactual" sleuthing should enjoy Dr. Joseph Merrill's narrative of discovering a most unusual bust of Hippocrates at the Ny Carlsberg Glyptotek in Copenhagen.

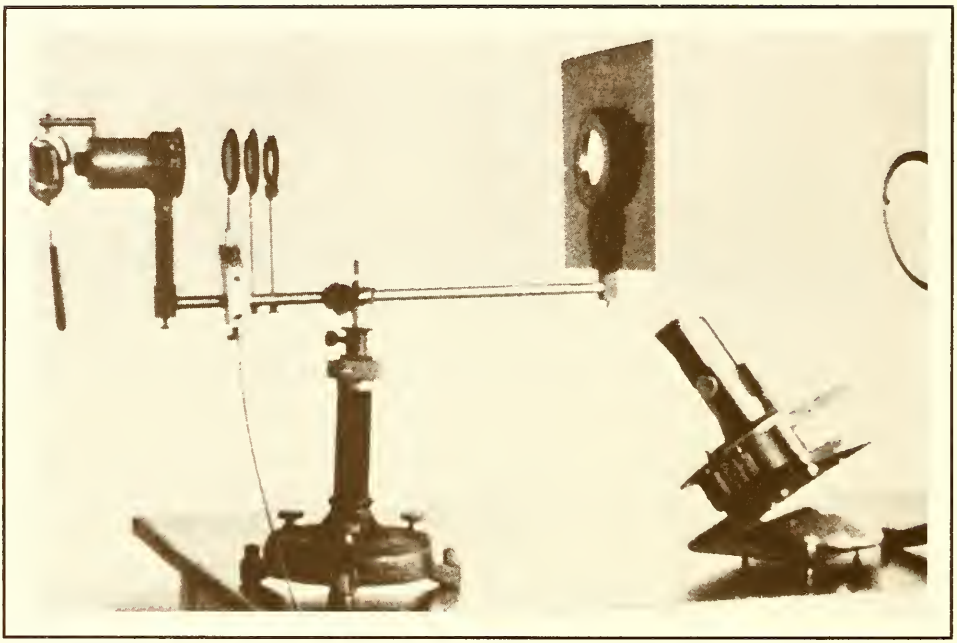
We need to collect and preserve the artifacts of technological advancements, particularly those of the magnitude of laser surgery. For the same reason we should preserve the observations of clinicians and patients who have been involved personally with the advancement. Museum exhibits need to convey not only the story of health care providers but also provide a sense of how disease and impairment affect perspectives of those for whom the technology has been developed.

Can those of us who are health care providers, medical historians and anthropologists, archivists and museologists--the principal readership of *Caduceus*--develop means and media both rehabilitative and habilitative? We have something to learn from the artists of "Art of the Eye." Perhaps by 1996 we can be prepared to define the healing role of museums, just as artists began to define the healing role of the arts at the Rockefeller symposium in 1976.

--Glen W. Davidson

NOTES

1. Maria Klein, "Preface," *Art of the Eye: An Exhibition on Vision* (Minneapolis: FORECAST Public Artspace Productions, 1986), 4.
2. Michael Jon Spencer, "A Case for the Arts," in *The Healing Role of the Arts*. Working Papers(New York: The Rockefeller Foundation, July, 1978),5.
3. "Art of the Eye" was organized by FORECAST Public Artspace Productions, in cooperation with the Minnesota Museum of Art and the Minneapolis Society for the Blind. The exhibition was shown first at the Minnesota Museum of Art in January, 1986. It currently is on display at the Cleveland Health Science Museum.
4. Klein, "Preface," 4.
5. *Ibid.*, 7.



One of the first photocoagulation attempts with instrumentation using sunlight. A heliostat and a system of lenses concentrated the sunlight so that it could be focused into an eye for the purpose of photocoagulation of various structures within the eye. (Courtesy Professor Gerd Meyer-Schwickerath.)

*Historical Aspects of Ophthalmic Lasers**

Francis A. L'Esperance, Jr.

The historical aspects of ophthalmic lasers have been fascinating and exciting. The eye, because of its precise structure, has been the recipient of a large amount of the transfer of technology from the physical sciences to the biologic sciences. Because the eye is the organ that receives various formations of light for eventual cerebral interpretation, it was (purposefully) subjected to high-intensity incandescent light sources and then to laser emissions from basic instruments that had been developed by physicists. Although light has been known to affect the eye for milleniums, only recently have ophthalmologists, working closely with physicists, developed therapeutic systems that could control or cure eye diseases.

SOLAR EXPERIMENTATION

Plato's *Phaedo* contains a passage in which Socrates admonishes that one must take care not to look directly at the sun during an eclipse but to view the sun's reflection in water or some other such medium. The effect of solar radiation was well known to the ancients, and references continued into the Middle Ages, when the first description of a central scotoma following a solar burn of the retina was reported by Theophilus Bonetus (1620-1689).[11] Descriptions of the ophthalmoscopic appearance of solar burns became widespread after the ophthalmoscope came into use, and many ophthalmologists collected cases following solar eclipses (Birch-Hirschfeld,[9] Blessing,[10] Cords[13]).

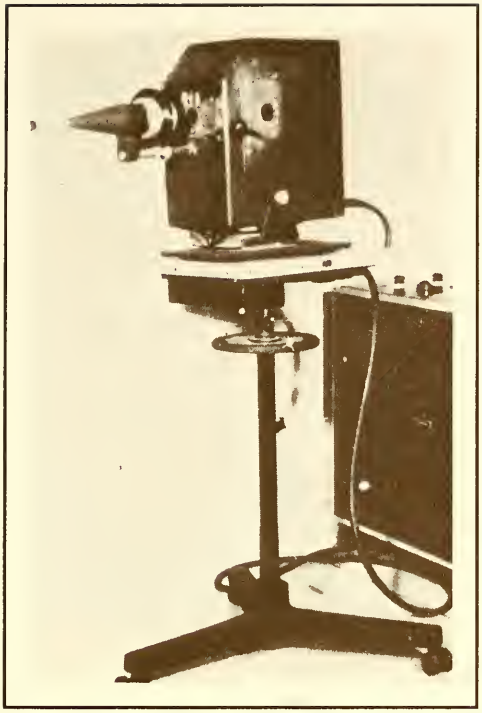
(*Reprinted by permission from L'Esperance, Francis A., Jr. *Ophthalmic Lasers,* ed. 3. St. Louis: The C. V. Mosby Co., 1989.)

Accordingly, experimentation with the effect of light on the retina was carried out by a series of investigators, including Czerny,[14] Deutschmann,[15] and Widmark.[38] These investigators used either the effects of the sun or the carbon arc to produce a lesion in the retina. Early experimentation with the effect of radiation damage on the human retina was carried out by Maggiore,[27] who focused sunlight on two eyes scheduled for enucleation; these eyes were studied histologically and were found to show marked hyperemia and edema of the retinal structures. Moran-Salas[32] performed numerous experimental procedures on human and rabbit eyes during the late 1940s to use light coagulation therapeutically. He failed to publish his results until after Meyer-Schwickerath,[29] who was working concurrently, published his first clinical experiences with light photocoagulation in 1949. Moran-Salas then published his findings in 1950, corroborating the previous publications of Meyer-Schwickerath.

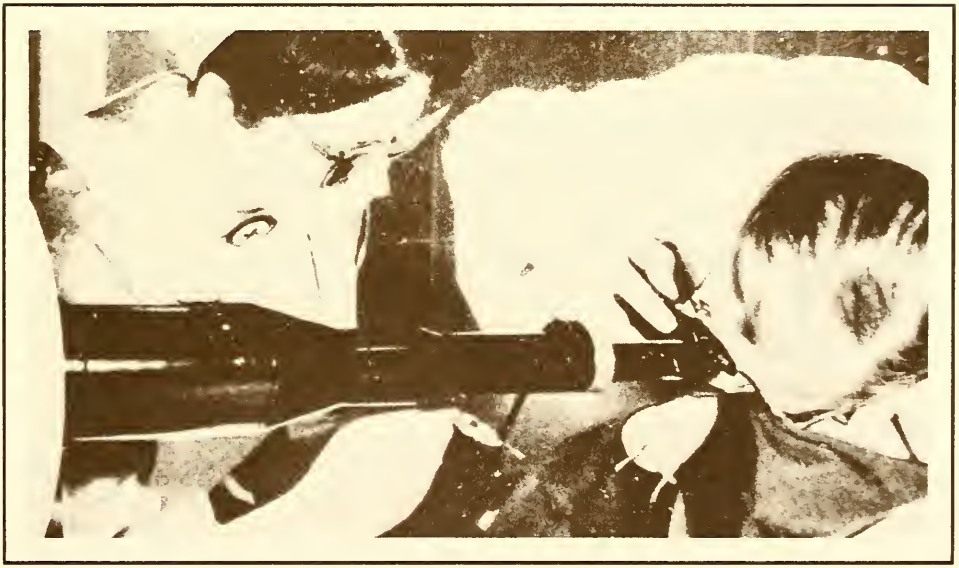
Since the eclipse of the sun on July 10, 1945, Meyer-Schwickerath had worked with various methods of instrumentation that he believed could produce a therapeutic photocoagulation burn. Sunlight was used for some time, but this method proved to be impractical because of the length of time needed for therapeutic coagulation, the intricate optical systems required, and the dependence on weather conditions, time of day, and time of year. Between 1949 and 1956 a Beck arc was modified to be used as a photocoagulation source but had the disadvantages of having a short photocoagulation span and producing gases saturated with soot and carbon particles. In 1956 the high pressure xenon lamp was used as a photocoagulation source, and the xenon-arc photocoagulation instrument, pioneered by Meyer-Schwickerath,[30] was made commercially available by Zeiss.

MILESTONES OF PHOTOCOAGULATION

400 BC	Plato recognizes ocular danger of sun
1640 AD	Bonetus warns of eclipse blindness
1945	Atomic bomb blindness
1946	Atomic bomb blindness research
1948	Meyer-Schwickerath experiments
1956	Xenon-arc photocoagulation
1960	Advent of the laser



Moderately sophisticated device for early photocoagulation using a Beck-arc, shutters, an optical system, and a hand-held mirror, which channeled the Beck-arc radiation into the patient's eye for photocoagulation. (Courtesy Professor Gerd Meyer-Schwickerath.)



Very early photocoagulation procedure by Meyer-Schwickerath in 1956 using the newly developed Zeiss high-pressure xenon-arc bulb as a photocoagulation source. (Courtesy of The C.V. Mosby Co.)

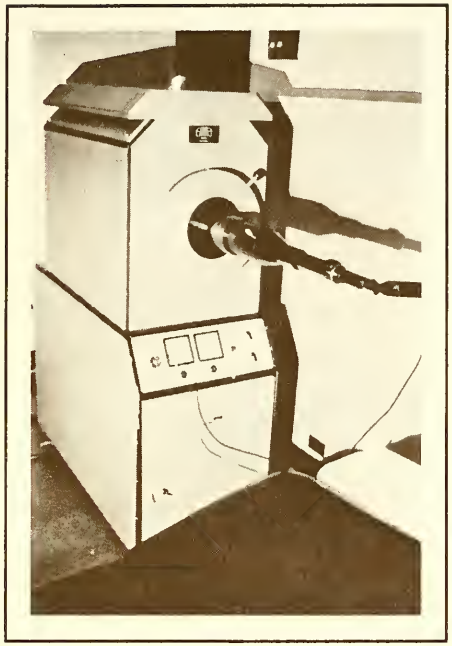
THE LASER

In 1960 Maiman[28] produced the optical maser (or laser, as it was eventually called), using a ruby crystal to produce a 200-μs pulse of intense red light energy. This monochromatic light had a wavelength of 694.3 nm and provided the ophthalmologic world with an intense, pure beam of light that could produce extremely small burns of varying intensities. In 1961 Zaret and others[41] began experimentation with ruby laser photocoagulation in animals, and both Campbell and others[12] and Zweng and others[42] treated human patients the following year. The ruby laser was found to be highly effective in producing an adhesive chorioretinitis but was not useful in the treatment of vascular diseases. A series of laser sources, each with different characteristics, have been considered, investigated, and used clinically for varied durations during the quarter century that has followed. The box below shows ophthalmic lasers, their date of clinical introduction, and the investigator most closely associated with their first use.

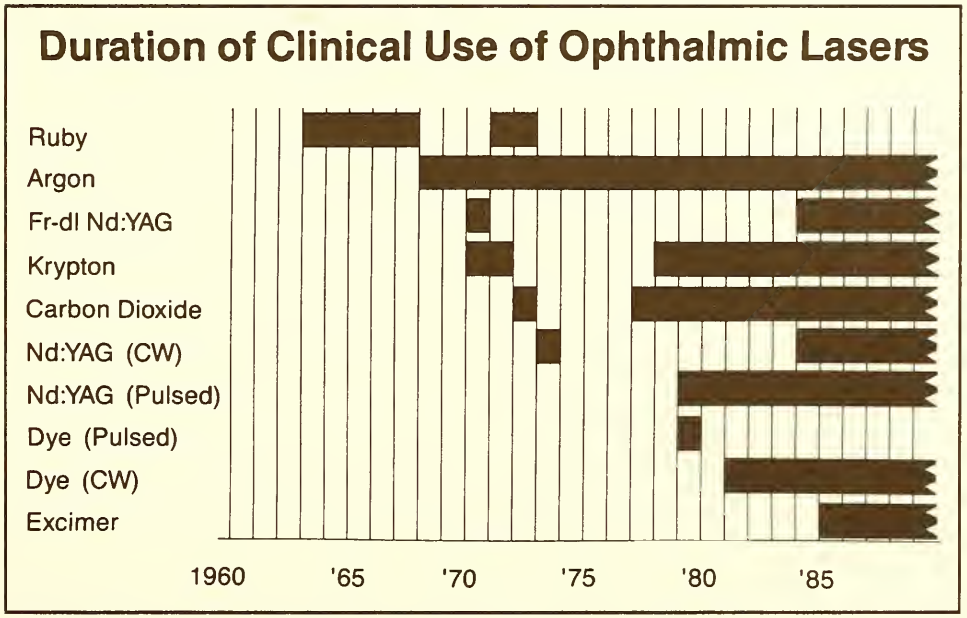
OPHTHALMIC LASERS:
FIRST CLINICAL USE

1963	Ruby	Campbell, Zweng
1968	Argon	L'Esperance
1971	Frequency-doubled Nd:YAG	L'Esperance
1972	Krypton	L'Esperance
1972	Carbon dioxide	L'Esperance
1973	Nd:YAG (CW)	Beckman
1979	Dye (Q-switched)	Bass
1981	Dye (CW)	L'Esperance
1981	Nd:YAG (Q-switched)	Fankhauser
1981	Nd:YAG (mode-locked)	Aron-Rosa
1985	Excimer	Wöllensak, Seiler

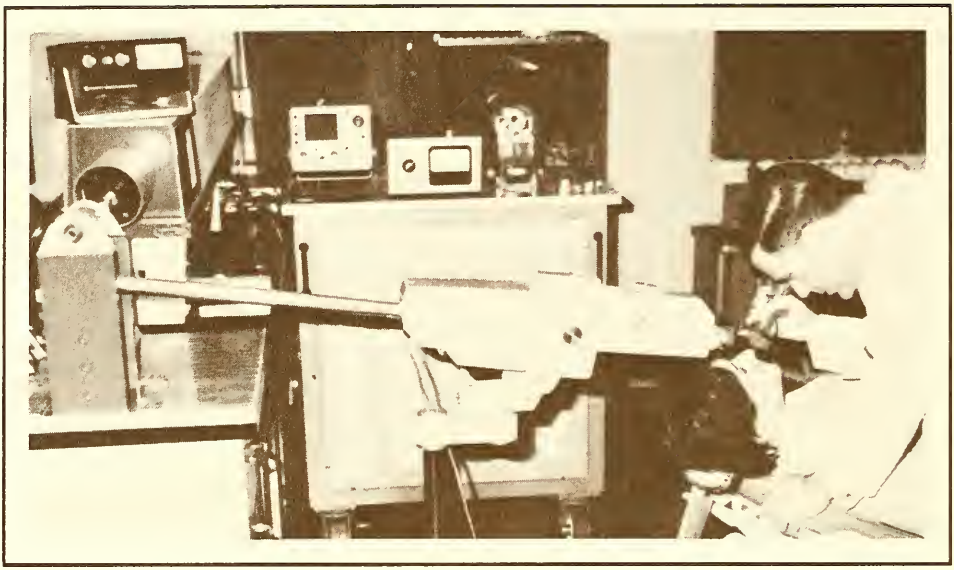
The use of the argon ion laser in the treatment of ophthalmic vascular disease was first considered in our laboratory in early 1965, and histopathologic studies with animals and the design and development of multiple photocoagulation systems to deliver the argon laser beam to the human eye were undertaken there from 1966 to 1968. At the Edward S. Harkness Eye Institute in the Columbia-Presbyterian Medical Center on February 14, 1968, we conducted the first photocoagulation trial using argon



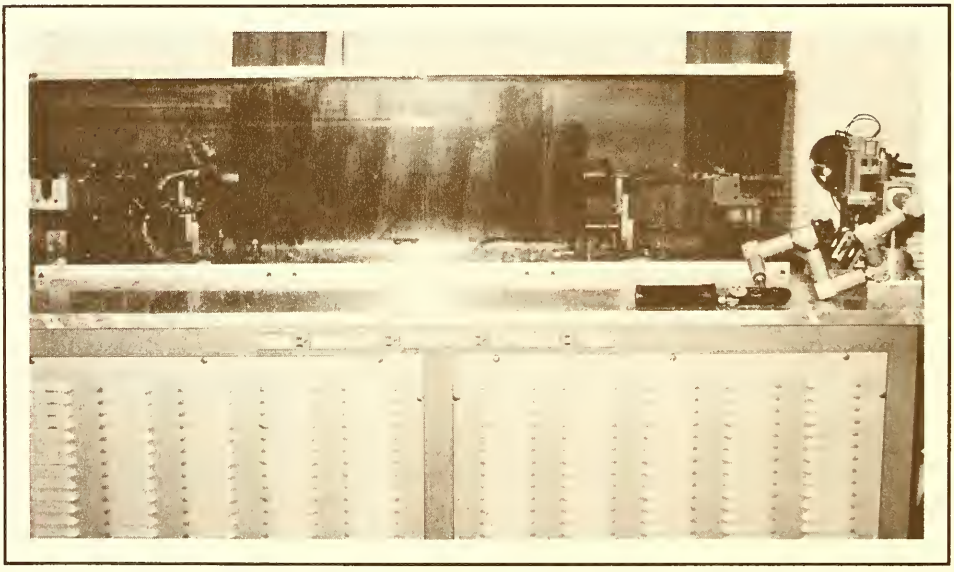
Appearance of the high-pressure xenon-arc bulb photocoagulation instrument produced by Zeiss with the extended arm containing various optical devices for manipulation of the beam before photocoagulation. (Courtesy of The C.V. Mosby Co.)



Diagrammatic representation of introduction of various ophthalmic lasers and their duration of clinical use. (Courtesy of The C. V. Mosby Co.)



First clinical argon laser photocoagulation system, which was constructed and used initially at the Columbia-Presbyterian Medical Center. (Courtesy of The C. V. Mosby Co.)



First ophthalmic krypton laser photocoagulation system in existence in our laboratory at the Columbia-Presbyterian Medical Center in 1970. The laser tube and solenoid are shielded by plastic, with the articulated-arm delivery system projecting to the right of the photograph. (Courtesy of The C. V. Mosby Co.)

laser radiation on a human.[21] During the following year over 500 cases of various ophthalmic diseases were treated in our laboratory with our newly designed direct, indirect, and slit lamp biomicroscopic argon laser photocoagulation delivery systems.

In May 1969 Little and others[26] began their clinical argon laser photocoagulation studies (as did Patz and others[34] and Okun and others[33]) with instrumentation that incorporated modifications of our original design. Commercial argon laser photocoagulation systems became available in 1971, six years after the inception of the argon laser project. Presently, over 8000 argon laser photocoagulators have been distributed to various parts of the world, and this laser and other, more recent, lasers have made possible multiple new ophthalmic therapeutic procedures that were noninvasive and more effective than conventional methods.

In 1971 our laboratory conducted clinical trials concerning the photocoagulation potential of the krypton (1972)[23] and the frequency-doubled neodymium: yttrium-aluminum-garnet (Nd:YAG) (1971)[22] lasers in a series of patients. Although the laser radiations from these particular sources were more highly absorbed by the pigments of the eye, the technologic difficulties in producing the laser beam militated against their immediate use for therapeutic photocoagulation. During recent years the yellow (568.2-nm) and especially the red (647.1-nm) krypton laser beams have been used particularly in the treatment of macular disease where transmission through the xanthophyll pigment is desirable. Commercially available krypton lasers, designed to operate at a certain wavelength, or krypton-argon laser combinations have been used as photocoagulation systems with great benefit in certain diseases. Because of the inconsistent reproducibility of the nonlinear crystal necessary for the frequency-doubling with the Nd:YAG laser, the pea-green (532.0-nm) beam emitted from this laser was not available commercially for photocoagulation until recently. The creation of the potassium-titanium-phosphate(KTP) crystal has made photocoagulation with the frequency-doubled Nd:YAG laser practical because of the high power available at 532.0 nm. The pulsed Nd:YAG laser was introduced in 1980 by Fankhauser and others[16] and Aron-Rosa and others[2] with excellent results for the lysis of transparent ocular membranes and tissues, particularly opacified posterior capsules and vitreous strands.

In 1971 the carbon dioxide (CO_2) laser was used by Beckman and others[6] to produce keratectomies and sclerectomies in animals. Extensive research with more sophisticated systems was conducted by Beckman and Fuller[3] and by our laboratory. Several external ocular growths on human eyes were removed by

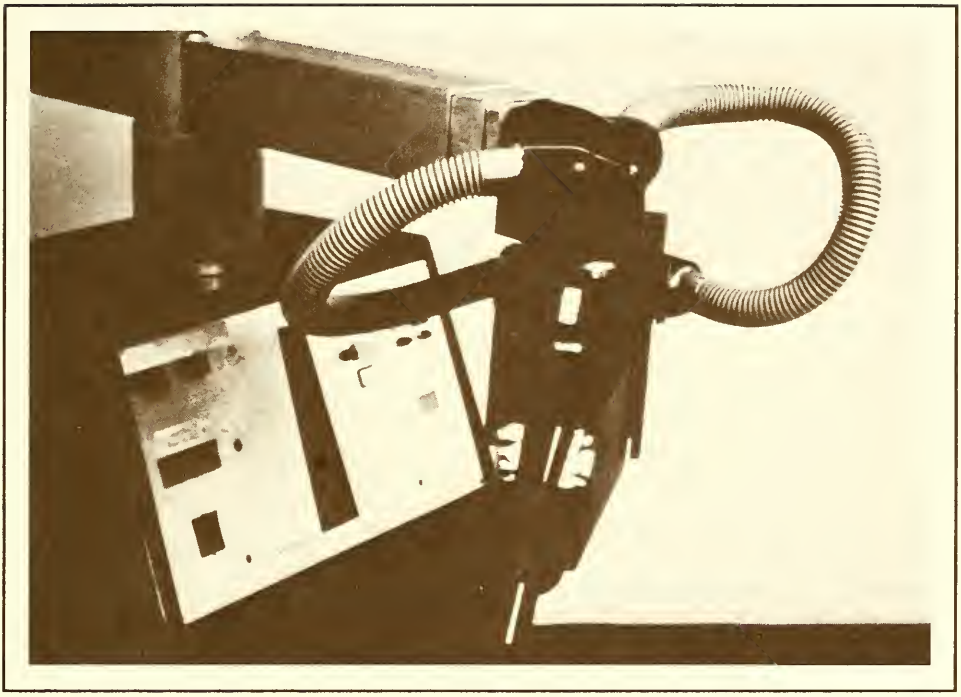
CO_2 laser photovaporization in our research facility by primitive instrumentation.[24] Beckman and Fuller[3] reported successful results with CO_2 laser trephination of human eyes with glaucoma in 1979, as did Ticho and others[37] in 1979. Intravitreal manipulation and chorioretinal coagulation with CO_2 laser radiation was reported by Miller and others,[31] and the use of the CO_2 laser has now gained a firm position as a device for the cauterization, vaporization, and incision of ocular tissue.

The box on page 12 lists multiple ophthalmic laser procedures with their date of introduction and the individual most closely associated with the particular procedure. In 1973 Krasnov introduced treatment of the trabecular meshwork by a Q-switched ruby laser (goniopuncture) in patients with glaucoma, to make this area more permeable to the outflow of aqueous fluid.[19] Hager[17] treated the trabecular meshwork in a similar manner using an argon laser, followed soon after by Worthen and Wickham.[40] In 1979 Wise and Witter[39] suggested a variation of the treatment procedure, which made laser trabeculoplasty, as it was to be called, a uniformly successful therapy.

Laser iridotomies produced by the ruby laser in an original series by Beckman and Sugar[4] in 1973 and by the argon laser in a series by Abraham and Miller[1] in 1975 introduced a new use for concentrated laser energy. Continual sophistication of the procedure has resulted in the relegation of surgical peripheral iridectomy to specialized situations where a laser iridotomy cannot be done.

Transscleral irradiation of the ciliary body by Beckman and others using the ruby laser in 1972[7] and the continuous-wave (CW) Nd:YAG laser in 1973,[5] and transpupillary laser cyclocautery by Bernard and others[8] in 1977 were presented as alternative treatments for intractable glaucoma and have been used with some success in selected cases.

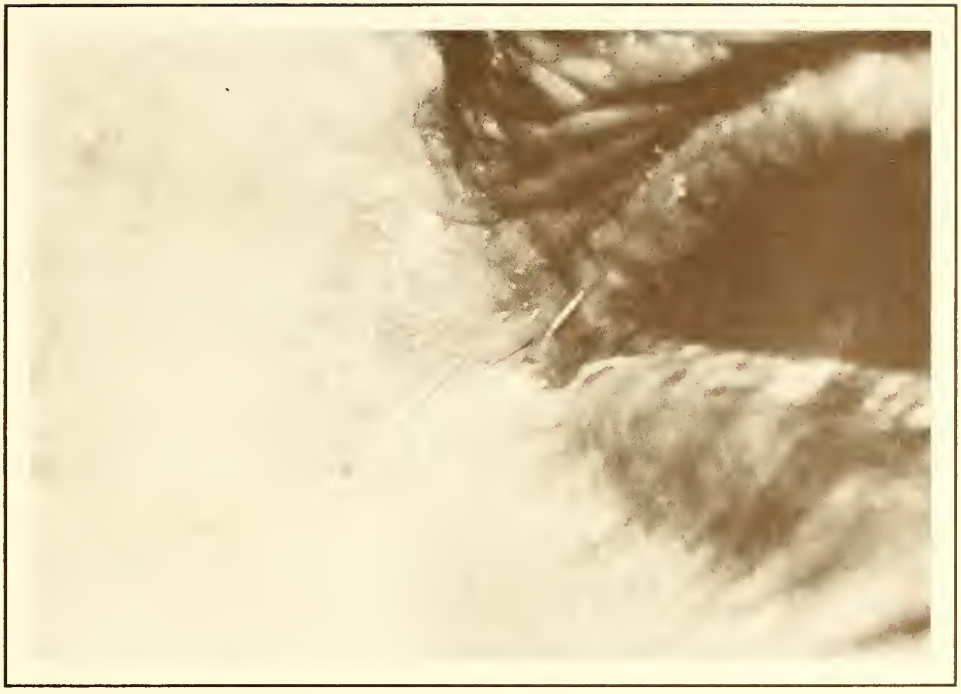
Other glaucoma procedures have been introduced during the past several years. These include laser goniophotocoagulation by Simmons and others[36] in 1977, laser gonioplasty by Krasnov and others[20] in 1974, and laser photomydriasis by L'Esperance and James in 1975.[25] These laser surgical techniques have been therapeutically beneficial with certain types of glaucomatous conditions. The total armamentarium of laser procedures not available to control primary and secondary glaucoma is considerable, and the use of actual operative procedures is diminishing as new laser techniques and instrumentation are being introduced to combat all variations of glaucoma.



Frequency-doubled Nd:YAG photocoagulation system typical of that which was first constructed and used initially at the Columbia-Presbyterian Medical Center. (Courtesy of The C. V. Mosby Co.)

A

B



C

***A** (facing page), First ophthalmic use of CO_2 laser photovaporization, by our laboratory group at the Columbia-Presbyterian Medical Center, on a keratotic growth near the inner canthus. **B** (facing page), Appearance of the keratotic area immediately after CO_2 laser photovaporization. **C** (above), Appearance of the area of photovaporization of the keratotic growth 3 weeks after CO_2 laser photovaporization. (Courtesy of The C. V. Mosby Co.)*

OPHTHALMIC LASERS: PROCEDURE LANDMARKS

1963	Zweng, Campbell	Clinical ruby laser
1968	L'Esperance	Clinical argon laser
1971	L'Esperance	Clinical frequency-doubled Nd:YAG laser
1972	L'Esperance	Clinical krypton laser
1972	L'Esperance	Clinical CO_2 laser
1972	Beckman	Ruby laser transscleral cyclocoagulation
1973	Beckman	Clinical CW Nd:YAG laser
1973	Krasnov	Ruby laser goniopuncture
1973	Beckman	Ruby laser iridotomy
1974	Krasnov	Argon laser gonioplasty
1975	L'Esperance	Argon laser photomydriasis
1975	Abraham	Argon laser iridotomy
1977	Bernard	Argon laser transpupillary cyclocoaguation
1977	Simmons	Argon laser goniophotocoagulation
1979	Wise	Argon laser trabeculoplasty
1980	Fankhauser, Aron-Rosa	Clinical pulsed Nd:YAG laser
1981	L'Esperance	Clinical dye laser
1985	Seiler, Wöllensak	Clinical excimer laser

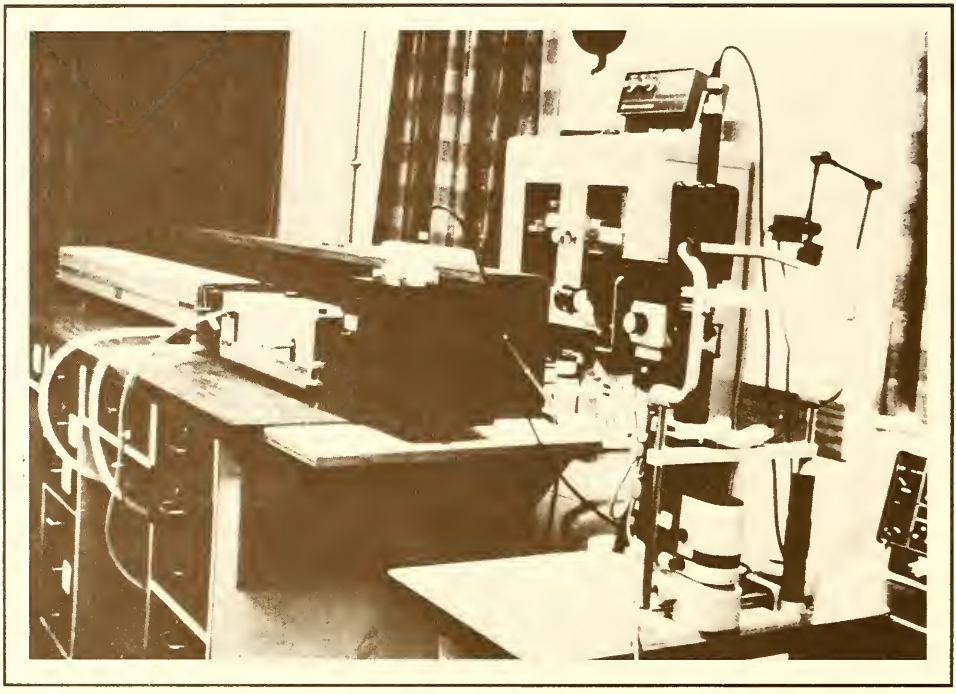
The use of the Nd:YAG laser in the Q-switched[16] and mode-locked[2] configurations has introduced a new dimension in laser therapy in ophthalmology whereby transparent tissues such as the anterior or posterior lens capsule or transparent membranes in the vitreous can be cut by extremely short bursts of laser energy. The applications for lasers of this type (such as the erbium: yttrium-lithium-fluoride (YLF) pulsed laser introduced by Horn and others[18]) for the production of iridotomies, lysis of synechiae, phacofragmentation, and other techniques that use a microacoustic and hydrodynamic shock wave appear to be enormous and will obviously supplant many presently used surgical procedures.

The introduction of the tunable organic dye laser to ophthalmology in our laboratory in 1981, first as a source for photodynamic therapy and soon after as a source for photocoagulation therapy, made possible the precise penetration or absorption of a specific wavelength by a target tissue. The use of the dye laser in ophthalmology will increase tremendously in the years ahead because of the ability of this particular laser to produce wavelengths in any portion of the visible spectrum at relatively high powers. Therefore certain wavelengths can be accurately tailored to treat a particular disease

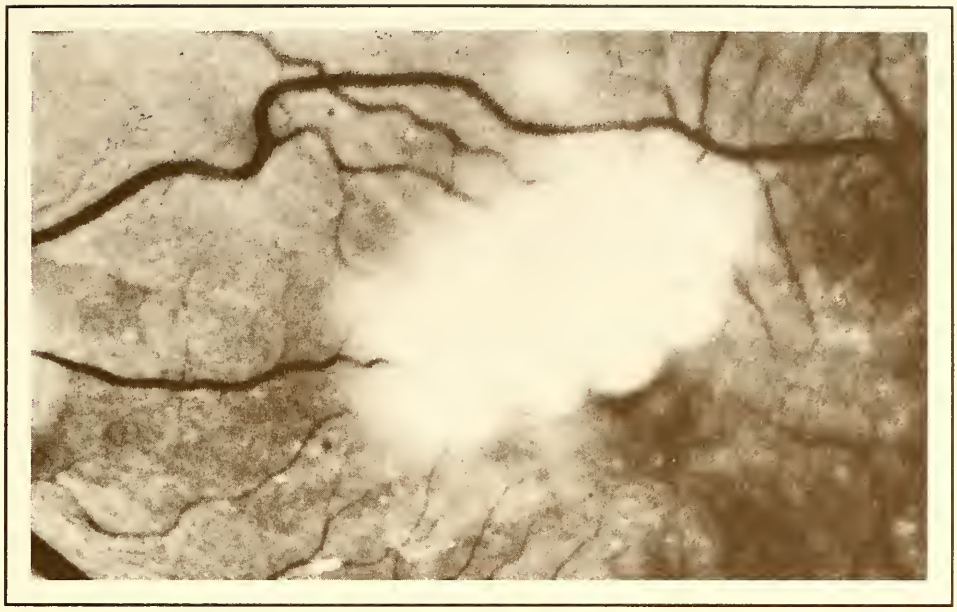
process. Photoradiation of malignant ocular tumors, sensitized by hematoporphyrin derivative or other agents, use the monochromaticity of a laser for excitation of the photosensitizing substance within the tumor or other portion of the eye. In this manner the entire science of photodynamic therapy or phototherapy should prove to be highly beneficial as a new type of ophthalmic treatment.

The process of photoablative decomposition, using excimer lasers, has been employed clinically by Seiler and Wöllensak[35] (1985) to make incisions in the cornea and by myself (1987) for recontouring or sculpting the anterior surface of the cornea, both for the purpose of correcting refractive errors of the eye. The sophisticated use of these ultraviolet excimer lasers for ablation of ocular tissues (cornea, lens, sclera, etc.) with great precision should prove to be immensely useful.

At the time of this writing, the helium-cadmium, helium-selenium, helium-neon, xenon, hydrogen fluoride, erbium: YAG, holmium, copper vapor, gold vapor, Raman-shifted Nd:YAG, alexandrite, diode, and a host of other lasers have not been used therapeutically in ophthalmology, although these lasers have undergone preliminary investigations in the laboratory. It is hoped that these newer laser systems will be used in the future to increase our armamentarium against ocular disease.



Prototype tunable organic dye laser that was constructed and first used clinically at the Columbia-Presbyterian Medical Center; overall view shows pumping argon laser (left), dye laser component (center), and dual beam splitter apparatus and biomicroscopic delivery system (right). (from L'Esperance, F.A., Jr: "Current Applications of the Dye Laser," In New Orleans Academy of Ophthalmology: Symposium on the Laser in Ophthalmology and Glaucoma Update, *St. Louis: The C.V. Mosby Co, 1985.*



A

B

***A** Paramacular coagulations of telangiectatic leaking retinal vessels in a diabetic patient--the first patient treated with the organic dye laser photocoagulation system (585 nm). **B** Area treated by dye laser photocoagulations in the same patient showing obliteration of the abnormal vasculature. (Courtesy of The C. V. Mosby Co.)*

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AUTHOR

Born in New York City in 1932, Francis A. L'Esperance, Jr., M.D., holds an undergraduate degree from Dartmouth College and a medical degree from Harvard Medical School. He interned in surgery at Columbia-Presbyterian Medical Center and completed his residency in ophthalmology at the Massachusetts Eye and Ear Infirmary. After joining the staff of the Edward S. Harkness Eye Institute at Columbia-Presbyterian, he launched his investigations into photocoagulation, soon taking up the applications of lasers to ophthalmology.

Dr. L'Esperance has been a Governor of the American College of Surgeons, an Appointee to the National Health Resources Commission by President Carter, recipient of the William B. Mark Award for Outstanding Contributions to Laser Medicine and Surgery, and, most recently, received the Arthur L. Schawlow Award for distinguished contributions in the applications of lasers for science, industry and education.

Dr. L'Esperance has written or edited eight books on laser ophthalmology and has authored more than 130 scientific articles and chapters on the same topic. One of three keynote speakers at the 1986 International Congress in Rome, Italy, he lectures widely on the subject of lasers each year. Dr. L'Esperance continues to practice in New York and maintains wide-ranging interests in the general field of ophthalmic lasers.

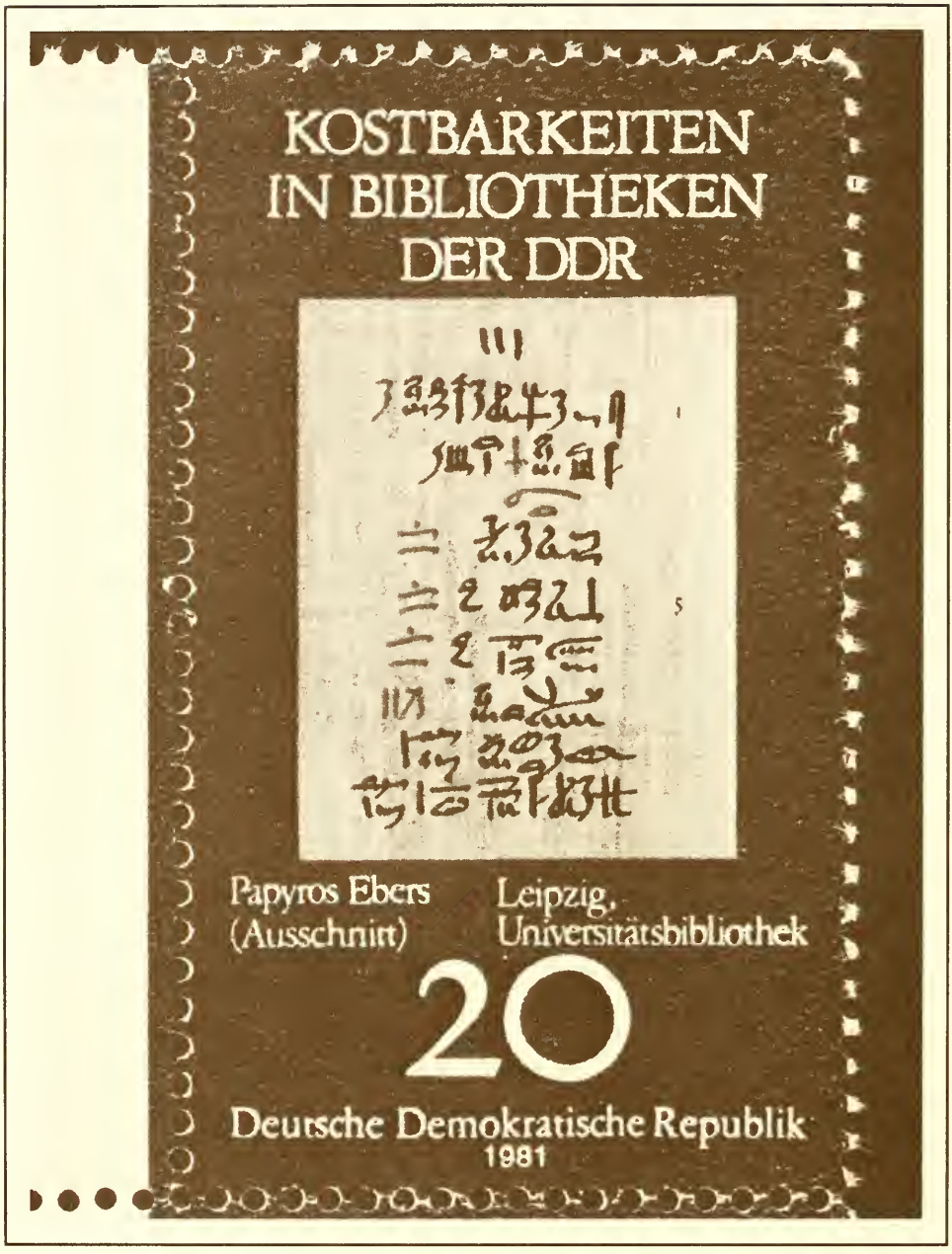


Fig. 1. Stamp issued by the German Democratic Republic in 1981 commemorates the papyrus discovered by Egyptologist Georg Ebers in 1879. This papyrus is preserved in Leipzig at the university library. (#2207. Photo courtesy of the author.)

Viewing Ophthalmology Through Postage Stamps

Frederick C. Blodi

Many important phases and personalities in the history of ophthalmology have been depicted on postage stamps. Although the resulting picture does not necessarily present a continuity, it does emphasize certain peaks and high points in the evolution of this specialty. I have selected a few of the more important individuals who contributed significantly to the advancement of ophthalmology.

OPHTHALMOLOGY IN ANCIENT EGYPT

Most of our knowledge of Egyptian ophthalmology stems from a manuscript discovered by German Egyptologist Georg Ebers, who, during his second trip to Egypt in 1879, found this important source, translated the work and published it with explanatory remarks. Written between 1553 and 1550 B.C., the papyrus actually consists of a collection of prescriptions. While the diseases included in the manuscript are only mentioned by name, the prescriptions themselves are discussed in detail. It is evident that ancient Egyptians were familiar with trachoma and its treatment, but other abnormalities, such as cataract, are not mentioned. The Ebers papyrus, as it has come to be called, is now preserved in Leipzig.

A stamp in honor of Ebers' discovery was issued by the German Democratic Republic in 1982 (Fig. 1). An earlier Egyptian stamp, issued in 1971, shows the papyrus in the center, the Egyptian physician Hesy Ra on the left, and the emblem of the World Health Organization on the right.

HIPPOCRATES (460-377 B.C.)

Hippocrates was born on Kos, a Greek island near the shores of Asia Minor. A true physician, Hippocrates is credited with initiating scientific medicine. He liberated medicine from the temples and the interpretation of dreams, from philosophy and mysticisms, and founded a science based on experience from which an astute observer could draw the correct conclusions. His writings are indicative of great wisdom, a noble and bright intellect, a humane attitude toward patients and dignity of the healing arts.

Although there is no extant volume on eye disease by Hippocrates, many of his manuscripts contain detailed chapters describing the physiology, pathology and therapy of ocular conditions.

Greece issued a commemorative stamp honoring Hippocrates in 1947 (Fig 2).

GALEN (131-201 A.D.)

Greek physician Claudius Galenus was born in Pergamos (Asia Minor), the son of a wealthy architect. After studying philosophy in Pergamos, Galen turned to medicine, continuing his studies in Smyrna, Corinth and Alexandria. Although he practiced initially in Pergamos, later he moved to Rome, where he became physician to the emperor. Renowned for his scholarship throughout the known world, Galen established a canon of medicine which was to be prevalent for 1500 years.

Unfortunately, Galen's ophthalmic manuscripts are not preserved. However, numerous eye diseases are discussed in his general medical work. Galen recognized the cataract (hypochyma), which he explained as a transpiration of fluid congealing in the area of the pupil between the iris and the crystalline lens. In his manuscript about topical medications, Galen mentioned many eye diseases and their treatment.

The Yemen Arabic Republic issued a stamp honoring Galen in 1966.

RHAZES (AL RAZI) (850-923)

Rhazes was born in the province of Horasan (now Eastern Turkey). He began to study medicine when he was thirty and then went on to practice both in Baghdad and Horasan. Rhazes was a superb clinician, observer and prolific

Fig. 2. Greek stamp issued in 1947 commemorates Hippocrates and his enormous contributions to medicine. (#514. Photo courtesy of the author.)

Fig. 3. Arabian physician Avicenna (Ibn Sina) is perhaps best remembered for his encyclopedia Al-Quanum. This stamp was issued in his honor in 1971 by the government in Qatar. (#237. Photo courtesy of the author.)

writer. He is regarded as one of the greatest of the Arabian physicians of the Middle Ages and is credited with the first description of measles and smallpox.

His *opus magnum* was the *Continens (Al Hawi)*, an encyclopedia of medicine. This work supposedly consisted of 232 "books," though only some of them have been preserved. In his encyclopedia Rhazes collected everything ever written or known about medicine, utilizing information from Indian and Greek authors (especially Galen) and the early Arabian sources. The second book of *Continens* includes Razes' descriptions of eye diseases and operations on the eye.

In 1964 the government of Iran issued a stamp commemorating the contributions of Rhazes.

AVICENNA (IBN SINA) (980-1037)

One of the greatest Arabian physicians was Avicenna, called the "princeps" (sheik) of Arabian medicine. Avicenna was born near Burhara. The son of a governor, he became an important philosopher and state minister.

His most famous work is the canon of medicine (*Al-Quanun*), an encyclopedia of enormous scope, in which the tenets of medicine are presented in a most exhaustive and systematic way. *Al-Quanun* was appendaged with numerous commentaries, glossaries and versifications and was translated into Latin a hundred years later by Gerard of Cremona.

In the third chapter of his third volume, he discusses eye diseases and their treatment thoroughly and systemetically. Avicenna was one of the first to use the term *sabal*, for which we use the Latin *pannus*, a condition unknown to Greek authors in antiquity. Like Aristotle and Galen before him, Avicenna dominated medical thought for five hundred years. The government of Qatar issued a commemorative stamp of Avicenna in 1971 (Fig. 3).

PETRUS HISPANUS (POPE JOHN XXI) (?-1277)

Petrus Hispanus or Peter Juliani, as he was commonly called, was born between 1210 and 1220 in Lisbon, at that time part of the Kingdom of Castile. Peter has the distinction of having been the only Portuguese and the only physician ever elected pope. The son of a physician, Peter studied medicine at the University of Paris. After graduating in 1247, he left for the newly-founded University of Siena, where he was appointed professor of medicine.

Peter authored about a dozen books on medicine, among which was a pharmacopeia for poor patients (*Thesaurus pauperum*) and a book on diet. He became most famous for his breviary on eye diseases and their cures (*Breviarium magistri petri hyspani de egritudinibus oculorum et curis*). This book later was noteworthy enough to earn the praise of Guy de Chauliac and its prescriptions were copied for his own personal use by Michelangelo Buonarroti in the sixteenth century.

Around 1262 Peter gave up his medical activities, returned to Lisbon and began his career as a churchman. He first was dean of the cathedral chapter and superintendent of schools in Lisbon. He later became bishop of Mondonedo, prior of Mafra, archbishop of Braga (Portugal) and finally chaplain to Pope Urban IV. Under Pope Gregory X, Peter was appointed chief physician (archiater) in 1272, became a cardinal in 1274, and was elected pope on September 15, 1276. He proved to be a mild and conciliatory pontiff.

In honor of their most famous son, the Portuguese issued a stamp of Peter in 1977.

AMBROISE PARÉ (1510-1590)

Ambroise Paré developed from a typical barber surgeon to one of the most outstanding military surgeons of France. In 1554, in spite of the fact that he did not know Latin, Paré became a member of the Surgical College of Saint-Come.

Paré's main work, *Chirurgie*, includes operations on and around the eye. He devised his own cataract needle, which he would test before an operation by pushing it several times through his cap or through another piece of clothing.

Paré became famous partially because of his treatment of injuries during the war. He described many eye injuries which he had repaired. Perhaps the most interesting one, which occurred in 1582, involved a man with a saber injury across his face and head. For local treatment Paré still used the accepted treatment of pigeon's blood, but rejected the mummy extract then in use. Around the wound he applied egg white whipped in rosewater. Copious bloodletting was always indicated. Paré still believed in the charms popular at the time in treatment and introduced the nefarious neck rope for the treatment of eye diseases. He had his own collyria and treated lacrimal fistulas with a hot iron while protecting the globe with a metal shield.

Paré was the first to use artificial eyes placed into the orbits of his patients. Previously, artificial eyes had only been used for statues. If Paré could not insert an artificial eye into the orbit, then he set a painted shell fixed by a wire to the ear in front of the blind eye. He is also remembered for his motto: "I will dress it and God will cure it."

The French government issued a stamp in Paré's honor in 1943, reproducing a portrait of the surgeon painted by an unidentified artist from the period. The painting, in the style of Clouet, now hangs in the Louvre.

DOKTOR EISENBART (1661-1727)

One of the more famous itinerant barber surgeons was Johann Andreas Eisenbart, who also was called the Miracle Doctor. Born in Oberviechtach in Lower Bavaria, Eisenbart was the son of a surgeon and learned the trade from his brother-in-law, Alexander Biller. He remained an apprentice for ten years and then started traveling across Europe as a barber surgeon. Itinerant surgeons moved from city to city operating on hernias, bladder stones and cataracts. Many of these barber surgeons became successful and experienced in couching the cataract, largely because educated physicians thought it beneath their dignity to operate on eyes. (As far as ophthalmology is concerned, the most famous among these surgeons was Georg Bartisch, whose book *Der Augendienst* was the first book on eye diseases written in a native tongue since Roman times.)

Eisenbart performed many cataract operations in German cities, especially in Altenburg, Weimar, Dresden and Berlin. A certificate signed by King Wilhelm of Prussia shows him to have received the title of "Royal Prussian Court Oculist." His methods became known especially through the popular folksong of the day which described many of his patients "cured according to his fashion" (such as amputating a leg as treatment for gout!). Actually, he was a better surgeon than he appeared to be in the song.

Eisenbart invented a special needle for couching a cataract. He also was known for his tendancies towards the flamboyant--one report of his cataract operations on three patients in Strasbourg mentions that the surgery apparently was performed in the open marketplace with bells ringing and trumpets sounding. He flooded towns with his advertisements and handbills and collected testimonials from high and low. In one testimonial a hops merchant verified that Eisenbart had restored the merchant's beloved wife's sight after she had been blind for seventeen years.

Fig. 4. This German stamp, issued in 1977, shows Dr. Eisenbart approaching a patient with a cataract needle in his right hand, ready to couch. (#1264. Photo courtesy of the author.)

Eisenbart's tombstone in Minden mentions specifically that he was court oculist in Prussia. The stamp shown in Figure 4 depicts Dr. Eisenbart approaching a patient with the cataract needle in his right hand ready to couch.

HERMAN BOERHAAVE (1668-1738)

Herman Boerhaave was born near Leiden, The Netherlands. Having studied philosophy in Leiden and then medicine in Harderwyck, Boerhaave spent his professional life at the University of Leiden, where he was professor of botany, medicine and chemistry and twice rector. He contributed greatly to the reputation of the university, which became one of the most important medical centers in Europe. Given the appellation the "great teacher of the century," Boerhaave attracted hundreds of students from all over the world. He became world famous with his two books, *Institutiones Medicae* (1708) and *Aphorisms* (1709).

Boerhaave's thoughts on ophthalmology were preserved by his pupils, who posthumously published textbooks on ophthalmology based on their professor's notes. From his lectures it is clear that as early as 1708 Boerhaave had accepted the new concept concerning the site of the cataract as proposed by Brisseau and Maître-Jan in France. A. von Haller was the first to publish these notes. They were based on a manuscript by J. R. Zwinger, later professor in Basel (1692-1777).

A second publication was by L. Heister (1683-1758), professor in Helmstädt and founder of scientific surgery in Germany. Another of his ophthalmic pupils was John Taylor of England, one of the most infamous itinerant ophthalmic surgeons.

Boerhaave's pupils could be found all over Europe--Uppsala (Linné), London and Dublin. Especially intensive and fruitful was the connection with the University of Edinburgh (Monro, Rutherford, Sinclair).

His contribution to mathematics, botany and chemistry are numerous and important. His is the first textbook that contains a reasonably scientific discussion on refractive errors. He was greatly interested in the circulation of blood and described the aqueous veins of the eye (though he thought they were filled with skimmed plasma).

In 1928 the Dutch issued a commemorative stamp in Boerhaave's honor.

GERARD VAN SWIETEN (1700-1772)

Gerard van Swieten was one of the most famous students of Boerhaave. Although a member of the University of Leiden, he could not teach medical students because he was Catholic. In 1745 the Empress Maria Theresia invited him to Vienna to undertake a reform of medical education in Austria. Van Swieten not only became the personal physician of the Empress, but was also the protomedicus and, as such, the first physician at the university. He reorganized medical teaching and, as a faithful follower of Boerhaave, put bedside teaching into the center of medical education.

Van Swieten also initiated teaching of ophthalmology. He first invited Italian cataract surgeon Natalis Giuseppe Palluci (1790-1807) to Vienna to perform cataract operations. However, this course of action did not seem too successful because when one member of the imperial court needed a cataract operation, van Swieten called the famous Baron Michael de Wenzel for the operation to Vienna. Wenzel's fee was no less than 10,000 florins, but he was also supposed to teach two Viennese physicians, Homburg and Leber, how to extract a cataract. When Homburg and Leber proved unsuccessful in their endeavors, finally Joseph Barth was called to the imperial city.

Austria issued a commemorative stamp of van Swieten in 1937.

ALBRECHT VON HALLER (1708-1777)

Albrecht von Haller was born in Bern, Switzerland, and entered the University of Tübingen at the age of fifteen. There he studied medicine, and then transferred to the University of Leiden, where he was graduated at age nineteen. He continued his anatomical research in London and Paris, returning to Basel to study higher mathematics and botany. Von Haller began his practice in 1729 in Bern, but in 1736 was appointed professor of anatomy, surgery and botany at the newly founded University of Goettingen. Acknowledged as one of the greatest scientists of the century, Haller's experimental and literary achievements are enormous. In 1753 he returned to Basel, where he remained and worked as a civil servant.

He edited Boerhaave's lectures on ophthalmology and his physiology of vision summarizes previous knowledge and contributes a number of new discoveries. He was the first to introduce the term *visual field* or *campus*.

Haller wrote encyclopedic summaries covering many aspects of science. His *bibliotheca* summarized and evaluated critically all previous publications and

contributions in a certain field. The book concerned with surgery also included a section on ophthalmology and is the most complete list of all previously published books, monographs and articles. Similar *bibliotheca*, all written between 1771 and 1778, cover medicine, anatomy and botany. Harder called Haller the most intelligent compilator of the century. He was knighted by the Empress Maria Theresia.

A commemorative stamp of Albrecht von Haller was issued by the government of Switzerland in 1934.

PIETER CAMPER (1721-1789)

Pieter Camper was born in Leiden, The Netherlands, and was graduated from the university there as doctor of philosophy and medicine. He was professor in Franeker, then in Amsterdam and finally in Groningen. Camper contributed considerably to comparative anatomy and other areas of science. He was a skillful surgeon, who could couch or extract a cataract.

In 1766 he wrote a manuscript entitled *De Oculorum Fabrica et Morbis Commentaria*. This work is the transition from medieval to modern ophthalmology. It is certainly one of the best of his time. The *Commentaria* remained unprinted for a long time, but because it constituted the contents of Camper's lectures, it was to have considerable influence on the progress of ophthalmology.

The Dutch government issued a stamp in Pieter Camper's honor in 1940.

JACQUES DAVIEL (1693-1762)

The modern era of ophthalmology begins with Jacques Daviel, the genial Frenchman who, in the middle of the eighteenth century, invented and popularized the cataract extraction. As of that time, ophthalmology can be regarded as a truly independent specialty of medicine. The first independent academic eye department was established at the University of Vienna in 1816 and its first chairman was J. Beer.

Daviel was born in the little village La Barre, not far from Rouen, on August 11. His father was the village notary. He grew up in this area, which is called L'Ouche and belongs to Normandy.

Louis XIV still reigned in France. The peace of 1697 was followed by a new war about the Spanish succession which began in 1701, and it was during this

Fig. 5. Commemorative stamp of Jacques Daviel was issued in 1963 by the French government. Among other major contributions to the specialty of ophthalmology, Daviel is credited with the development of the cataract extraction procedure.(#B369. Photo courtesy of the author.)

time that Daviel started as an apprentice with a barber and surgeon in nearby Bernay. He then went to Rouen to work at the hospital and with his uncle Sallou, one of the local surgeons. Around 1708, Daviel went to Paris. He worked there at the Hôtel Dieu. Daviel then joined the Army Medical Corps and continued his training and practice of surgery. In 1714, when the war was over, Daviel returned to Paris.

The plague invaded Marseilles in1720, the infection having been carried into France by a ship from the Middle East. The epidemic took an enormous toll and hundreds of thousands died. Jacques Daviel volunteered for medical services and worked for a whole year in various towns in Provence.

In 1723 he started his practice as a surgeon in Marseilles and at the same time became a professor of anatomy and surgery at the local college. He confined his practice to ophthalmology in 1726. Daviel became a successful and well-known cataract surgeon who was called for consultation and operations to Portugal, Italy and Germany. In 1745 he operated on a hermit who had only one useful eye. This operation ended in failure and started his experimentation on other types of cataract operations.

In 1746 Daviel moved to Paris, which became his permanent domicile. In 1749 he was appointed personal ophthalmologist to King Louis XV. He published his famous report on extracting a cataract in 1752. Daviel's successes were most impressive and his fame extended all over Europe. Attached to his well-known "Letter to the Blind," the famous encyclopedist Denis Diderot queried: "Who does not know the famous Daviel or who has not heard about him?"

After numerous experiments on autopsy eyes and on animals, Daviel became convinced that cataracts could be extracted from the posterior chamber. He presented his new operation and gave a survey of his results at the meetings of the Royal Academy of Surgery in Paris in 1752. At that time he could already review two years of experience on this procedure. With this invention, the cataract extraction began its slow but steady triumphal victory over all other methods of cataract operations.

The French government issued a commemorative stamp of Jacques Daviel in 1963 (Fig. 5).

Fig. 6. Austrian ophthalmologist Ferdinand Ritter von Arlt was an excellent teacher and superb surgeon. Among his students were some of the finest in the expanding field of ophthalmology. This stamp was issued by the Austrian government in 1937. (#B161. Photo courtesy of the author.)

JOSEPH BARTH (1745-1818)

Joseph Barth was born in Malta, studied medicine in Rome and Vienna and became professor of ophthalmology and anatomy at the University of Vienna in 1773. He was one of the first to produce permanent specimens of various organs by injecting wax, resins or other congealing material in blood and lymph vessels.

He was also a surgeon and learned the cataract operation from itinerant surgeon Baron Michael de Wenzel, a somewhat dubious character who combined a gift in ophthalmic surgery with a completely unscrupulous attitude and absolutely unethical behavior. Wenzel had come twice to Vienna to perform a few cataract operations for an exorbitant fee. The Empress Maria Theresia was shocked about the poor showing of the Viennese surgeons, though she had brought the famous Gerhard van Swieten from Leiden to reorganize medical teaching. The Empress requested Wenzel to instruct Barth in ocular surgery.

Emperor Joseph II wanted to initiate the development of an independent ophthalmological school in Vienna, following the trend of the time to establish clinics and departments in various medical specialties. Barth had been appointed oculist to the Emperor in 1776 and he obligated himself to train two ophthalmic surgeons for the Austrian states. One of them was Johann Ehrenritter, who died in 1800; the other one was Johann Adam Schmidt, who in 1788 had become associate professor of anatomy and surgery at the Josephinum. As of 1796, Schmidt was teaching ophthalmology, but did not become head of an independent department.

Barth seems to have been quite avaricious. Once, when the Empress wanted to pay him for treating a lady of the court, she said: "There, let him take that," pointing to a small purse. Barth took the purse and the small, elegant table on which the purse lay, and left. He remained jealous about his position as oculist in Vienna and refused to teach his most gifted pupil, Georg Joseph Beer (1763-1811), who had helped Barth with his anatomical preparations under the most ignoble circumstances. Nevertheless, Beer became a self-made ophthalmologist, the first professor of an independent eye department at any university, and the true founder of the Viennese ophthalmic school.

A commemorative stamp was issued in 1974 by the Maltese government.

FERDINAND RITTER VON ARLT (1812-1887)

Ferdinand Ritter von Arlt was born under modest circumstances in the German-speaking part of Bohemia and went on to attend the University of Prague, where in 1840 he became assistant to Johann Nepomuk Fischer (1777-1847), then the professor of ophthalmology. Fischer was under the influence of the new developments in pathologic anatomy as they were initiated in Vienna by Rokitansky.

Arlt published a three-volume textbook, *Die Krankheiten des Auges*, which was written for the practicing physician. Arlt had also spent some time with Rokitansky, accepted his pathologic methodology and applied it to ophthalmology. Arlt's anatomical explanations clearly established in 1854 that myopia is dependent upon the axial length of the globe.

In 1856 Arlt was appointed professor of ophthalmology at the University of Vienna, succeeding Rosas, who had followed Beer. This appointment created the great schism in Viennese ophthalmology, in dire opposition to the wishes of another powerful group, which had backed Eduard von Jäger, the gifted grandson of Beer, to become chairman of the department. When Arlt resigned in 1883, his successor was Carl Stellwag von Carion (1823-1904), whereas, Eduard Jäger von Jaxtthal, the son of Friedrich Jäger (Beer's son-in-law and professor at the Medical-Surgical Academy Josefinum in Vienna), became the first chairman of the newly created II.University Eye Clinic in 1883 just a few months before his death.

Arlt proved to be an excellent teacher and superb surgeon. He wrote a textbook on ophthalmic surgery and initiated many courses for practicing physicians. Among his students were A. von Graefe, Otto Becker (Heidelberg), Wilhelm Schulek (Budapest), Hubert Sattler (Leipzig), Otto Bergmeister (Vienna), Ernst Fuchs and Friedrich Dimmer.

Austria issued a stamp in honor of von Arlt in 1937 (Fig. 6).

FRANS CORNELIS DONDERS (1818-1889)

Frans Cornelis Donders was born in Tilburg, The Netherlands, in Brabant province not far from Eindhoven. At age eleven this son of parents with nine other children already earned his bread as an assistant teacher. At seventeen he entered the University of Utrecht. Upon leaving Utrecht, Donders studied at the Military Medical School and was greatly influenced by his professor of physiology, Schroeder van der Kolk. In 1840 he served as a medical officer in

Flushing and was graduated as doctor of medicine. He later returned to the University of Utrecht as lecturer at the Army Medical School to teach hygiene, medical legal autopsy, forensic medicine, anthropology, general biology, pathologic anatomy, and the physiology of vision. Donders was appointed associate professor when he was twenty-nine. In order to gain more income for his family, he translated the textbook of ophthalmology by Ruete into Dutch. Ruete was at that time professor of ophthalmology in Göttingen and later invented the indirect ophthalmoscope. Donders continued to teach physiology of vision and became more and more interested in ophthalmology.

In 1851 he traveled to London to attend the first international exhibition. He met William Bowman, the famous histologist and eye surgeon, and also Professor Eduard Jaeger of Vienna. The latter introduced him to the young Albrecht von Graefe. In London they heard about Helmholtz's invention of the ophthalmoscope.

Donders returned via Paris to Utrecht and at his own expense started an outpatient eye clinic for the poor, which was first located in the physiological laboratory. Later, a house which previously had been used as a nursing home during the cholera epidemics, was put at his disposal. Soon even the house proved too small and he was able to purchase a larger house next door, aided by contributions from townspeople. This new building was used as a hospital and outpatient clinic for eye patients. With thirty-five beds, this hospital was the first one for the eye in The Netherlands. A number of prominent ophthalmologists, among them H. Knapp of Heidelberg, Liebreich of Paris and Nagel of Tübingen, received some of their training at Donders' hospital in Utrecht.

Although he remained director of the hospital for twenty-five years, Donders never became professor of ophthalmology. He was professor of physiology from 1862-1888. Donders' book about anomalies of refraction and accommodation ranks with Helmholtz's physiologic optics and A. von Graefe's contribution to glaucoma. Donders was one of the main reformers of ophthalmology in the nineteenth century, and is credited with establishing the scientific foundations of emmetropia, myopia, hyperopia, astigmatism and convergence.

The Netherlands issued a commemorative stamp of Donders in 1935.

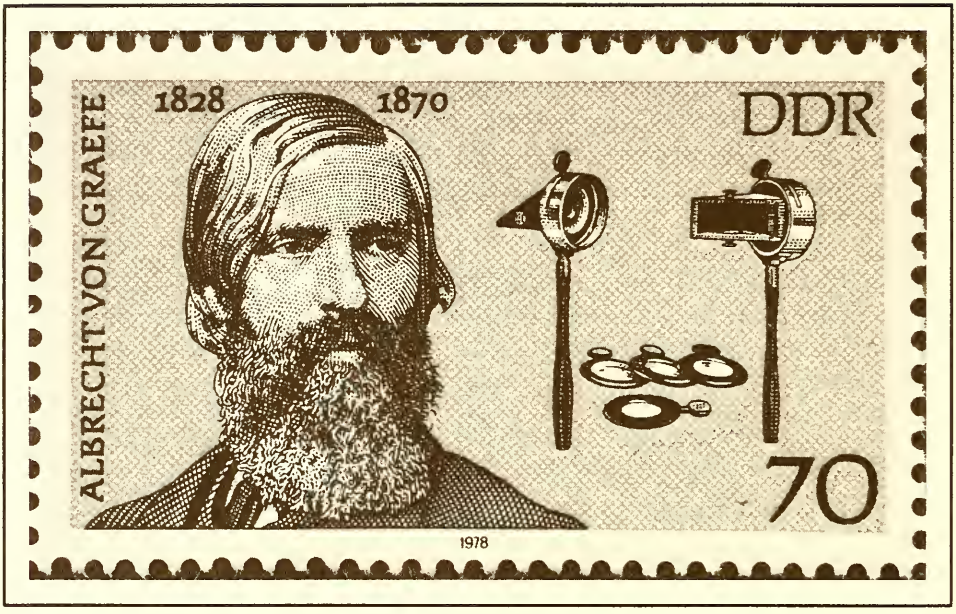


Fig. 7. Albrecht von Graefe is regarded as the greatest ophthalmologist in the history of the specialty. This commemorative stamp was issued in 1978 by the German Democratic Republic. (#1932. Photo courtesy of the author.)

ALBRECHT VON GRAEFE (1828-1870)

Albrecht von Graefe, the son of Carl Ferdinand von Graefe, one of the founders of German surgery, was born in Berlin and attended the French school there. He then studied at the University of Berlin, graduating in 1847.

Graefe traveled extensively. He went to Prague and worked with Ferdinand Arlt, who introduced him to ophthalmology. From there he went to Paris and Vienna, where he worked with Eduard and Friedrich Jäger. He later traveled to London, where he met William Bowman, to Glasgow, where he met William Mackenzie, and then to Dublin, where he introduced himself to William R. W. Wilde. From 1850 onwards, Graefe practiced ophthalmology in Berlin. Although he received academic rank, he never became the chairman of the department. In 1854 he founded the Archiv für Ophthalmologie. Graefe was a member and later president of the Medical Society of Berlin, and also a founder of the Heidelberg Ophthalmological Society.

Graefe is universally regarded as the greatest ophthalmologist to date. His clinical contributions include: the physiology and pathology of the oblique extraocular muscles, the silver nitrate treatment of conjunctivitis, description of the various types of hemianopia, the efficacy of iridectomy in acute glaucoma, occlusion of the central retinal artery by emboli, the recognition of papilledema, and the linear extraction of a cataract, among others.

Graefe suffered early from a tuberculous pleuritis and later on from a progressive pulmonary involvement. He died at forty-two, survived by most of his teachers.

The German Ophthalmological Society honors Graefe's memory by a Graefe Prize and the Graefe Medal, awarded every tenth year to the most outstanding ophthalmologist of the world.

A commemorative stamp was issued in 1978 by the German Democratic Republic (Fig. 7).

J. D. DA GAMA PINTO (1853-1945)

J. D. da Gama Pinto was born in Goa (Portuguese India), and began his ophthalmology training with J. Hirschberg in Berlin. He then went to the University of Heidelberg, where he became associate professor working under O. Becker.

Gama Pinto contributed to Becker's monograph on the *Anatomy of the Healthy and Diseased Lens (Anatomie der gesunden und kranken Linse)*, which appeared in 1883 and published a monograph entitled *Netzhaut-Glioma*.

Returning to Lisbon, he founded the Instituto Ophthalmologico, an eye hospital with 100 beds and an outpatient clinic.

Gama Pinto contributed the chapters on glaucoma and on sympathetic ophthalmia to the *Encyclopedie Francaise d'Ophtalmologie* (1906). In it he expressed his preference for the enucleation over the evisceration and rejects completely neurotomy as a surgical alternative.

He continued to work at the medical school in Lisbon, though there was at that time no professor of ophthalmology at that school, nor at the University of Coimbra.

He returned to Goa and died there in 1945. Goa issued a stamp of Gama Pinto in 1954.

ALLVAR GULLSTRAND (1862-1930)

Allvar Gullstrand was born in Landskrona, Sweden, the son of a general practitioner. Although he studied medicine at the University of Lund, his great interest in mathematics and optics influenced him and he entered a career in ophthalmology. His doctoral thesis was concerned with the mathematical approach to astigmatism. He was graduated from Lund in 1890.

Gullstrand practiced ophthalmology for four years in Stockholm, and then at thirty-eight was appointed chairman of the Department of Ophthalmology at the University of Uppsala, where he remained until 1914.

In 1911, upon his receiving the Nobel Prize for medicine and physiology, Gullstrand became the only ophthalmologist who ever received this high award. The prize was for "work on the diffraction of light by lenses applied to one eye." In 1914 Gullstrand was awarded the new chair of physical and physiologic optics in Uppsala, a position he occupied until his retirement in 1927.

Fig. 8. This Hungarian stamp, issued in 1972, commemorates the contributions of Swede Allvar Gullstrand, Russian Vladimir Petrovich Filatov and Swiss Jules Gonin. (#2143. Photo courtesy of the author.)

He continued to work on physiologic optics and calculated especially the optical imaging of an object. Gullstrand became one of the editors of the third edition of Helmholtz' *Handbook of Physiologic Optics*, published in 1894.

As far as clinical ophthalmology is concerned, Gullstrand is mainly remembered because of his construction of the first slit lamp. He also contributed some clinical papers (surgical correction of symblepharon) and was called a "dexterous and farsighted surgeon."

Hungary issued a commemorative stamp of Gullstrand, in conjunction with Jules Gonin and Vladimir Petrovich Filatov, in 1972 (Fig. 8).

JULES GONIN (1870-1935)

Jules Gonin was born in a small town in Switzerland. His forefathers came from the Piedmont area where they had been driven out because of their Protestant faith. He studied medicine at the University of Lausanne, receiving his diploma in 1896. He joined the eye clinic, which was then directed by Marc Dufour, the first professor of ophthalmology at Lausanne. (He had worked with Dufour previously while still a medical student.)

Gonin's scientific work soon turned toward the retina. In 1903 he published three papers on retinitis pigmentosa. He later cooperated with Dufour on the chapter of the retina for the French encyclopedia of ophthalmology and then worked on the anatomic pathologic features of retinal detachments.

In 1907 Gonin was one of the founders of the Swiss Ophthalmological Society and served as its president between 1910 and 1911. In 1920 he was appointed chief of ophthalmology at the University of Lausanne, following Samuel Eperon. Two years earlier he had been made chief physician of the hospital for the blind.

In 1920 Gonin gave an extensive report on the anatomic pathologic changes of retinal detachment at the annual meeting of the French Ophthalmological Society. In it he recognized the importance of vitreous traction and retinal holes. After elucidating the pathogenesis of retinal detachments, he reported in 1921 for the first time on the treatment of this condition by closing the retinal hole with thermal cautery. Reporting his results to the Swiss, French and German ophthalmological societies, Gonin met with a considerable amount of opposition and scepticism. He celebrated his first triumph at the International Congress in Amsterdam in 1929. With the publication of his

book on retinal detachment in 1934, the modern era of retinal detachment treatment had begun.

It is difficult to realize what progress Gonin's invention constitutes. Before his operation, the standard operation was the injection of 10 percent saline solution subconjunctivally and putting the patient to bed. This treatment improved the condition for a few patients for a short period of time. With the new operation the large majority of retinal detachments could be cured. Gonin insisted on the importance of an accurate ophthalmoscopic examination and he emphasized continually the importance of the ophthalmoscope over the cautery. His motto was "Look for the hold, find it, close it." His operation did for retinal detachment what von Graefe's iridectomy did for glaucoma.

The City of Lausanne honored Gonin by naming a street after him. It is the street which Gonin used to take when walking home from the hospital. The Swiss Ophthalmological Society and the University of Lausanne award every four years the Gonin Medal upon the recommendation of the International Council of Ophthalmology to the person who has contributed most to the progress of ophthalmology. The first recipient of the medal was Alfred Vogt of Zurich in 1941.

A commemorative stamp of Jules Gonin was issued by Switzerland in 1971.

VLADIMIR PETROVICH FILATOV (1875-1956)

Vladimir Filatov was graduated from the Moscow School of Medicine in 1897 and moved to Odessa in 1908.

In 1922, under the stimulus of reports from the Elschnig school in Prague, Filatov began a systematic study of corneal transplant operations. He extended the scope of this operation considerably by proving that, following a suggestion by Magitot of Paris, cadaver donor tissue could be used. He reported on this technique for the first time in 1930. Filatov could prove that donor eyes could be preserved at a temperature of +4° centigrade. He also was of the opinion that storing the cornea longer than four days was advantageous because it decreased the antigenicity of the tissue. A law was passed in 1937 allowing the general use of cadaver eyes for corneal grafting and this made the establishment of an eye bank in the Soviet Union unnecessary. Filatov used at first a conjunctival flap (1927) to fixate the graft.

In 1936 the government established the Ukrainian Research Institute for Eye Diseases and Tissue Therapy in Odessa and Filatov became its first

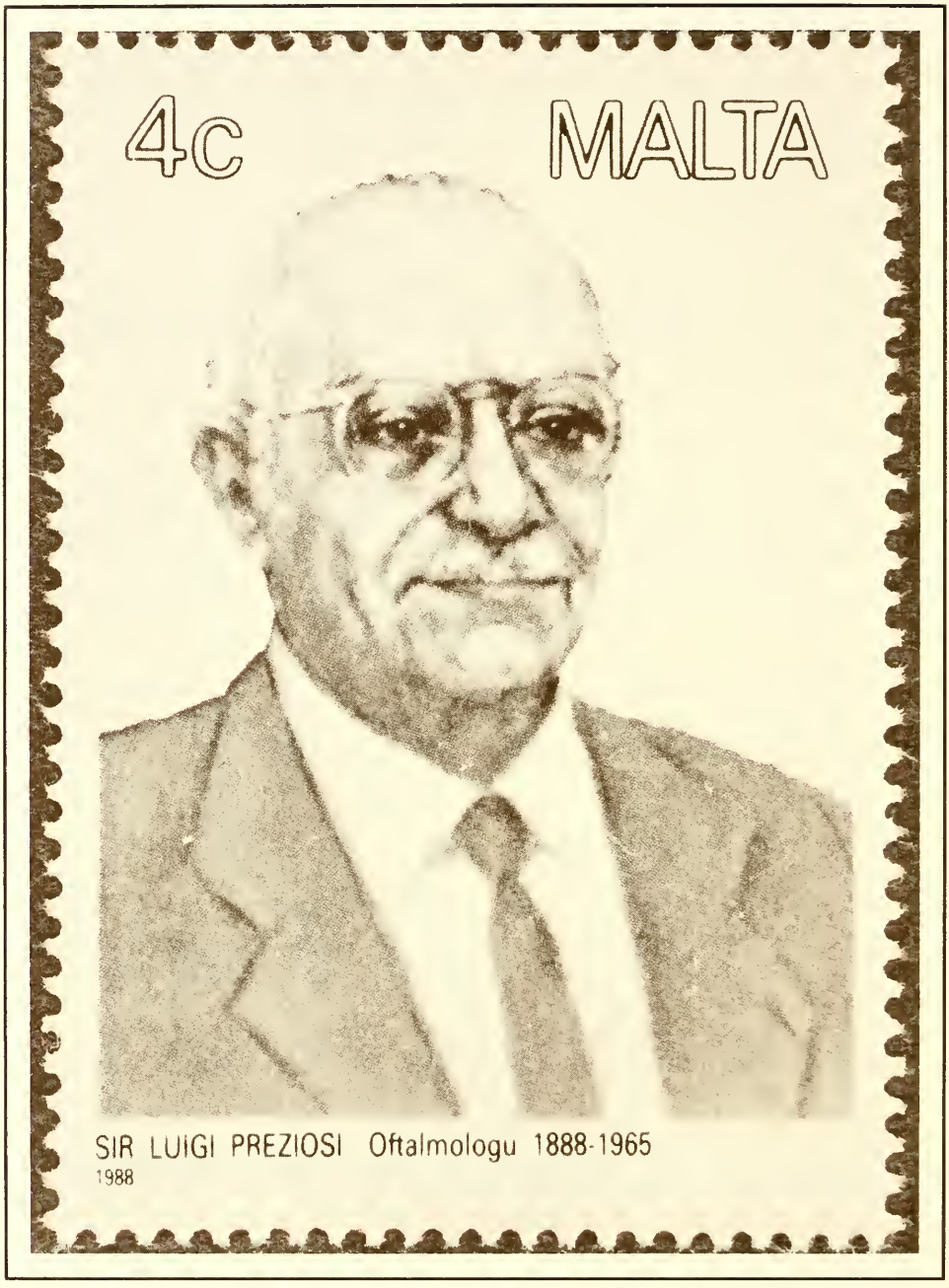


Fig. 9. A stamp honoring Sir Luigi Preziosi was issued by the Malta Postal Service in 1988 (#712. Photo courtesy of the author.)

medical director. This large institute has 430 beds and ample laboratory facilities. Filatov became a member of the Russian Academy of Sciences and received numerous international honors. In 1956 the institute was named after Filatov and his statue was erected in front of it.

The Russian government issued a stamp in Filatov's honor in 1962.

COUNT SIR LUIGI PREZIOSI (1888-1965)

Count Sir Luigi Preziosi came from an old artistocratic family in Malta. He attended the University of Malta and graduated as Doctor of Medicine in 1907. He then specialized in ophthalmology, working mainly with Cirincione in Rome. In 1920 he received the diploma of ophthalmology at the University of Oxford and from then on practiced continuously in Malta. In 1924 he was appointed professor of ophthalmology at the Royal University of Malta and chief ophthalmologist at the Central Hospital of Floriana.

Preziosi was interested in trachoma, which at that time was prevalent on Malta. In 1924 he devised a new glaucoma operation using the electrocautery to establish a fistule. This paper was read before the Camera Medica of Malta on April 5, 1924. In it he states that he first performed the operation January 20, 1923 and modified it on February 8, 1924. He reports on his first four cases. Interestingly enough, he did not combine it with an iridectomy. More than thirty years later, using only superficial limbal cautery, Harold Scheie of Philadelphia modified and popularized the operation.

As the son of the seventh Count of Preziosi, Luigi became involved early in the public life of the island. In 1927 he was elected to the senate of Malta and became its president in 1932. In 1944 he was elected president of the National Congress and in 1947 president of the National Assembly. He was knighted by the King of England in 1948. In 1949 he retired from public life, but continued to practice ophthalmology until he died on July 30.

Malta issued a stamp in Count Preziosi's honor in 1988 (Fig. 9).

IGNACIO BARRAQUER y BARRAQUER (1884-1965)

Ignacio Barraquer y Barraquer, the son of an ophthalmologist, was born and educated in Barcelona. He was graduated as doctor of medicine in 1908, receiving his training in local hospitals and later joining the practice of his father. He later built his famous clinic, which introduced a number of modern designs and became a model for microsurgical arrangements.

Barraquer became especially famous for the invention of the erysophake, a method which enables the surgeon to perform an intracapsular cataract extraction by suction. Barraquer invented numerous other instruments and modifications of surgical procedures.

In 1974 he founded the Barraquer Institute, a scientific institution of private character, dedicated to investigation and interchange of scientific ideas. Barraquer was member and honorary member of numerous scientific organizations. He received many honors, both in Spain and in foreign countries (for example, the Legion of Honor in France). Barraquer's two sons also became famous ophthalmologists. José is the director of a large ophthalmologic institute in Bogota, Colombia, while Joaquin continues his father's work at the clinic in Barcelona. Three grandchildren are also ophthalmologists.

Spain issued a commemorative stamp of Barraquer in 1984 (Fig. 10).

AUTHOR

Dr. Frederick C. Blodi was born in Vienna, where he also studied medicine. After graduating in 1940, he served in the army and then took his training in ophthalmology at the University Eye Clinic in Vienna. In 1947 he came to the United States, first as a fellow of the World Health Organization and later as a research fellow of the Department of Ophthalmology at Columbia University in New York. In 1952 Dr. Blodi accepted a position at the University of Iowa and became chairman of the department there in 1967. He became professor emeritus in 1984. Active in many aspects of ophthalmology, Dr. Blodi was President of the American Academy of Ophthalmology and also chaired the American Board of Ophthalmology. For nearly ten years he was the chief editor of the *Archives of Ophthalmology*.

Dr. Blodi has developed a keep interest in the history of ophthalmology. He is translating the monumental history by Julius Hirschberg, which was written before World War I in Germany. The first ten volumes of this undertaking have been published. For the past twenty years Dr. Blodi also has been a philatelist and has accumulated a large collection of postage stamps dealing with ophthalmology, the eye and vision.

Fig. 10. Ignacio Barraquer is most famous for his invention of the erysophake, which enables the surgeon to perform an intracapsular cataract by suction. This commemorative stamp was issued by Spain in 1984. (#2375. Photo courtesy of the author.)

NOTE: For a more complete list of pertinent men and stamps, see "The Eye, Vision and Ophthalmology on Postage Stamps," J.P. Wayenborgh Verlag, Bonn, 1986. The book is volume 11/B of The History of Ophthalmology by Julius Hirschberg. All stamp numbers refer to the Scott catalogue, except where indicated otherwise.

A rare bronze medal (left) commemorating the Fourth Congress for the amelioration of the plight of the blind. Bust of Abbas Hilmi II [1892-1914],(below left), an obscure official on reverse. Egypt, 1911. (Photo courtesy of Ophthalmic Heritage Department, Foundation of the American Academy of Ophthalmology.)

Ophthalmic Heritage at the Foundation of the American Academy of Ophthalmology

Susan E. Cronenwett

INTRODUCTION

The history of ophthalmology is greater than what can be preserved through the tangible objects in a museum or archive collection. It is a history of ideas, emotions, opinions, beliefs and the relationships between patient and doctor. It is a history of people. This rich heritage of professional medical eye care is preserved in the Ophthalmic Heritage Department of the Foundation of the American Academy of Ophthalmology.

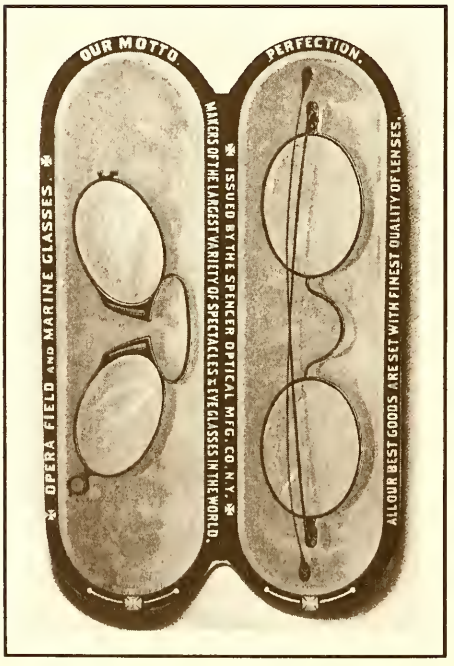
The department was first established in 1980 as a museum of ophthalmic artifacts. Today a unique collection which traces the development of ophthalmology and its intellectual and scientific growth is preserved through the:

- *Museum of Ophthalmology*
- *Historical Library*
- *Oral Histories Program*
- *Academy Archives*

These divisions collectively have been designed to preserve the complete history and heritage of ophthalmology. The goal is to interpret that history

CELLULOID OPTICAL GOODS
CO. DATE MAR. 13-77" STAMPED ON EACH PAIR."
CELLULOID SPECTACLES AND EYE GLASSES. "S.M.CO. DAT. MAR. 13-77" STAMPED ON EACH PAIR OF THE GENUINE. BEWARE OF IMITATIONS.
U.S.A. WE CALL YOUR ATTENTION TO OUR ARTISTIC STOCK
LIGHTEST, HANDSOMEST & MOST DURABLE. GREAT VARIETY. NOVEL STYLES. ATTRACTIVE GOODS. IN GOLD, SILVER, CELLULOID, STEEL, RUBBER, NICKEL & FRAMELESS.
Jewelers & Opticians.
ELMIRA, N. Y.

Colored lithographic trade card, Spencer Optical Manufacturing Co., New York, c. 1877. Trade cards were first introduced in 1730 and became a popular method of advertising. One, gift of David J. Noonan (left), and the other (below left), gift of Walter S. Marshall, M.D., to the Museum of Ophthalmology. (Photo courtesy of Ophthalmic Heritage Department, Foundation of the American Academy of Ophthalmology.)


OUR MOTTO.
PERFECTION.
OPERA FIELD AND MARINE GLASSES.
MAKERS OF THE LARGEST VARIETY OF SPECTACLES & EYE GLASSES IN THE WORLD.
ISSUED BY THE SPENCER OPTICAL MFG. CO. N.Y.
ALL OUR BEST GOODS ARE SET WITH FINEST QUALITY OF LENSES.

and the artifacts in the museum collection in order to give them meaning within the context of their creation or use. The key purpose is not to instruct, but to stimulate or arouse curiosity.

Although the focus of this article is on the museum and library, a brief introduction to the Foundation's other historical collections seems appropriate.

ACADEMY ARCHIVES

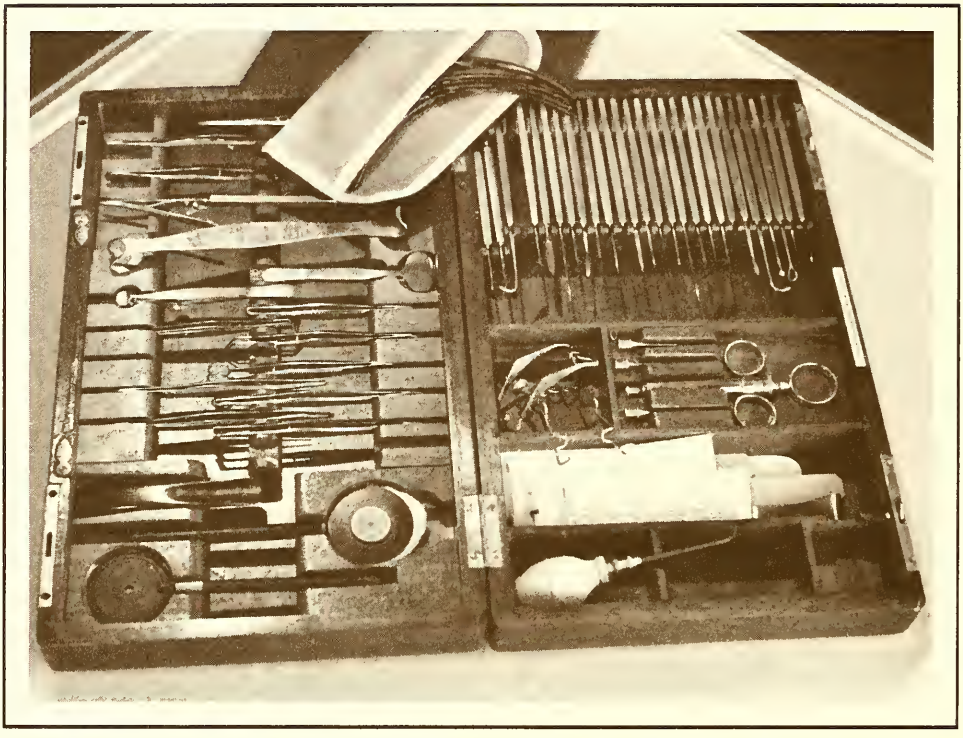
The Academy Archives is a growing collection preserving the history and traditions of the American Academy of Ophthalmology, a member organization established in 1896. The collection includes the first annual meeting program and other memorabilia and documents which trace the academy's changing role in organized ophthalmology. In preparation for the academy's centennial in 1996, ophthalmologists are researching different aspects of the association's history and will submit material for publication in ophthalmic periodicals during the years leading up to the centennial. An historical exhibition and celebration also are planned for the Academy's 100th annual meeting in Chicago.

ORAL HISTORIES PROGRAM

In 1986 the Oral Histories Program was established to preserve the heritage of ophthalmic history through the personal reminiscences of important individuals in ophthalmology. The histories of Drs. Dohrmann Pischel and Phillips Thygeson of the San Francisco Bay Area recently have been published and are available for purchase from the Foundation. Other participants in the program include: Drs. Thomas D. Duane and Harold G. Scheie, both of Philadelphia; Dr. Paul Boeder of Norfolk, Virginia; and Dr. David G. Cogan of Chevy Chase, Maryland. The published oral history transcripts are maintained in the Historical Library, along with the accompanying tapes and research materials.

Without the personal history of medicine, only the dry technical development of the profession is preserved. Through oral histories, the artifacts preserved in the Foundation's historical collections are brought to life. A box of Pischel pins from the museum collection reveals the delicate nature of retinal detachment surgery. These pins take on greater meaning in a reference from Dr. Pischel's personal account of what happened in 1931:

> Safar, who had been an assistant at the First Eye Clinic when I was there, was about to do his second retinal operation. He had en-



Ophthalmic Surgical Kit used by an EENT specialist in the military during World War I in the Canal Zone. Gift of Lloyd Mills, M.D., to the Museum of Ophthalmology. (Photo courtesy of Ophthalmic Heritage Department, Foundation of the American Academy of Ophthalmology.)

visioned, instead of draining through the hole with the [Gonin] cautery, [making] a series of punctures with the diathermy needle.

He said, "How can you drive a set of nail holes into a keg of beer without losing any beer? Well, you drive the nail in and leave it there. You have the nail hole and you don't lose the beer until you start pulling out the nail."

With that in mind, after I got home I developed these pins which you would put in a series around the tear and you didn't lose any fluid, so the eye had its tone and the retina didn't settle down to get into trouble. Then when you had made all your punctures, you pulled out your pins and got your drainage. You had a big advantage with the Safar operation because you had drainage through several points....

No one liked to work with Safar because this was a very slow business, locating the hole and everything, and he operated in the afternoon after the regular operating time was over. So the young men at the clinic . . . said, "You go and help Safar." I always look back on that as a milestone in my own education.[1]

As a museum professional, I can only interpret the history of ophthalmology from outside the ophthalmic community. An oral history presents ophthalmic history from the participant's perspective, infusing artifacts with a greater meaning beyond their mere technical aspects. There are many different interpretations, sometimes conflicting, that give history a vitality which the museum artifact in isolation often lacks.

THE MUSEUM OF OPHTHALMOLOGY

The historical collections of the Foundation have become an international resource for information on ophthalmic history. This success is due in large part to the extensive artifact collection of the Museum of Ophthalmology, located in the offices of the American Academy of Ophthalmology in San Francisco.

In 1984, when I accepted the position as Museum Coordinator there were approximately 500 artifacts in the collection displayed in small wooden cases on the mezzanine of the Academy offices. Today there are over 5,000 artifacts, most of which have been donated by Academy ophthalmologists. Without their personal interest in preserving the history of their profession, the collection

Chinese agate eye cup, circa 1650. Gift of Arthur L. Leonard, Jr., M.D., to the Museum of Ophthalmology. Eye cups, although very unsanitary if not sterilized between each use, were used to cleanse the eye. The earliest account of a receptacle to bathe the eye was in 1578 in England. It was listed among the household accounts of the Lestrange family of Hunstanton: "silver piece for mistresses Eyes. . . 5 shillings." The following passage is a description of the method of using an eye cup detailed in the first patent application for an eye cup filed by Merritt F. Potter in 1873:

> *Place the reservoir a little above the level of the eye. Then hold the cup on a level with the middle of the reservoir, and pour the liquid to be used into the reservoir.When the liquid appears in the bottom of the small cup, it may be fitted to the eye. If the head is now bowed downward, or the reservoir carried upward, the water will rise in the cup and bathe the eye.*
>
> *If one corner of the cup be held loosely against the eye, the cup will overflow and fresh liquid be brought in contact with the eye, and a continuous douche can thus be kept up for any length of time desired by keeping the reservoir supplied.*

(Photo courtesy of Ophthalmic Heritage Department, Foundation of the American Academy of Ophthalmology.)

would not be what it is today. Their generous contributions continue to support the growth and development of the collection.

The Collection

In order to preserve the diverse history of ophthalmology, the museum collects a variety of artifacts, including diagnostic and surgical instruments, pharmaceuticals, vision aids, memorabilia, stamps, coins, photography and art work. The oldest piece in the collection is an orange clay votive eye found in Israel, circa 200 B.C. The intention of the piece supposedly was used for the prevention and cure of eye disease. A variety of other pieces from the collection are pictured throughout this article.

Exhibits

As with most museums, there is a growing need for more room as the collection grows. A representative sample of the collection, however, is always on display in the main exhibit space located in the reception area of the Academy. Other exhibits are placed throughout Academy offices and the library for the enjoyment of both visitors and staff.

Each year the Foundation displays highlights from its historical collections at the annual meeting of the American Academy of Ophthalmology. In 1988 over 22,000 people attended this meeting in Las Vegas and a great number visited the exhibit titled "Extracting the Truth: An Historical Perspective on Cataract Surgery."

HISTORICAL LIBRARY

The Historical Library maintains a growing collection of ophthalmic texts and historical books, a majority of which predominates from the nineteenth and twentieth centuries. Also, a wide variety of reference materials are available to assist individuals with ophthalmic research of educational institutions, hospitals, associations, individuals and the museum collection.

The collection was greatly enhanced in 1988 by a generous donation from American Optical Company of Southbridge, Massachusetts. Their contribution includes books, trade literature, and other reference materials. (A list of the American Optical trade literature is included in Davis and Dreyfuss, *The Finest Instruments Ever Made,* published in 1987).[2] This collection was appraised and shipped to California this past autumn, where it will be inventoried and incorporated into the library.

Leather spectacles, Germany, circa 1300-1500, right lens missing. Gift of J. William Rosenthal, M.D., to the Museum of Ophthalmology. In his book, Illustrated History of Early Antique Spectacles,[3] *Hugh Orr states that "in 1305, in the Florentine Church of Santa Maria Novella, Fra Giordano di Ravalto, a monk of Pisa, stated in a sermon, 'It is not yet twenty years since the art of making spectacles, one of the most useful arts on earth, was discovered.'" This statement places the invention of spectacles in the Western World at about 1287. There is still debate whether the invention of spectacles in China preceded that of the Western World. (Photo courtesy of Ophthalmic Heritage Department, Foundation of the American Academy of Ophthalmology.)*

GOVERNANCE

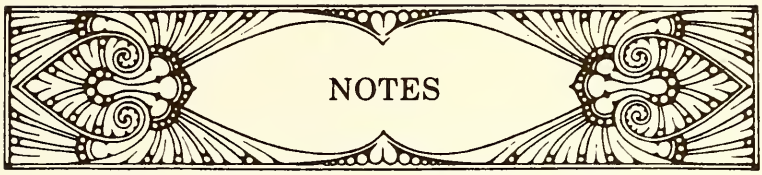
The Ophthalmic Heritage Department is supported by the Foundation of the American Academy of Ophthalmology and therefore is governed by the Foundation Board of Trustees. Recently, Dr. Frederick C. Blodi, an ophthalmologist in Iowa City, was selected to serve on the board as the first Vice Chairman of Ophthalmic Heritage. Under his direction are three committees whose volunteer members are ophthalmologists. The committees include the Oral Histories Committee, the Centennial Committee and the Museum Committee.

The Museum Committee was established early in the development of the collection in 1980. This committee's primary interest is to develop the museum through the acquisition of artifacts not yet represented by the collection. The members have extensive background in their area of specialization, including numismatics, surgical instruments, literature, etc. Museum Committee members give recommendations to staff and the board as to what items should be collected. Their collective knowledge and participation early on in the development of the museum has helped to create a cohesive collection.

CONCLUSION

The heritage of ophthalmology is a complex history we have only begun to preserve and interpret. In *The History of Ophthalmology,*[4] Dr. George Gorin quoted Treacher Collins, who opined that "the chief object of raking over the ashes of the past should be to acquire inspiration for the future." The Foundation's Ophthalmic Heritage department strives to be ophthalmology's inspiration.

Austrian or Northern Italian oil painting, circa 17th century, gift of Robert F. Kaiser, M.D., to the Museum of Ophthalmology. Although completely cleaned and restored in 1986, no additional information was gathered concerning this painting's provenance. (Photo courtesy of Ophthalmic Heritage Department, Foundation of the American Academy of Ophthalmology.)



NOTES

1. Bob Keaton, "Dohrmann Pischel, M.D., Recalls Ophthalmology's Early Days," *Argus*, [published by the American Academy of Ophthalmology], (April, 1986): 3. See also Dohrmann K. Pischel, M.D., "Ophthalmology Oral History Series, A Link With Our Past," an oral history conducted in 1987 by Sally Smith Hughes, Regional Oral History Office, University of California, Berkeley, in cooperation with the Foundation of the American Academy of Ophthalmology, San Francisco, 52.

2. Audrey Davis and Mark Dreyfuss, *The Finest Instruments Ever Made* (Arlington , Mass.: Medical History Publishing Associates I, 1986), 382-383.

3. Hugh Orr, *Illustrated History of Early Antique Spectacles* (published in England by Hugh Orr, 1985), 6.

4. George Gorin, *History of Ophthalmology* (Wilmington, Delaware: Publish or Perish, Inc., 1982), ix.

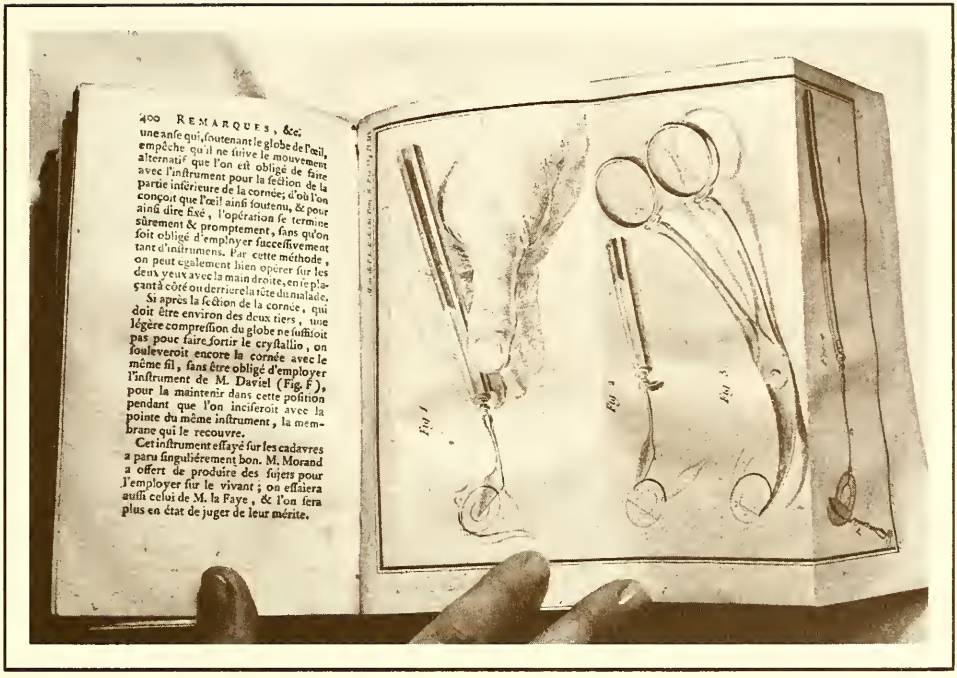
Main exhibit area of the Museum of Ophthalmology, San Francisco. (Photo courtesy of Ophthalmic Heritage Department, Foundation of the American Academy of Ophthalmology.)

OPHTHALMIC HERITAGE AND THE MUSEUM OF OPHTHALMOLOGY

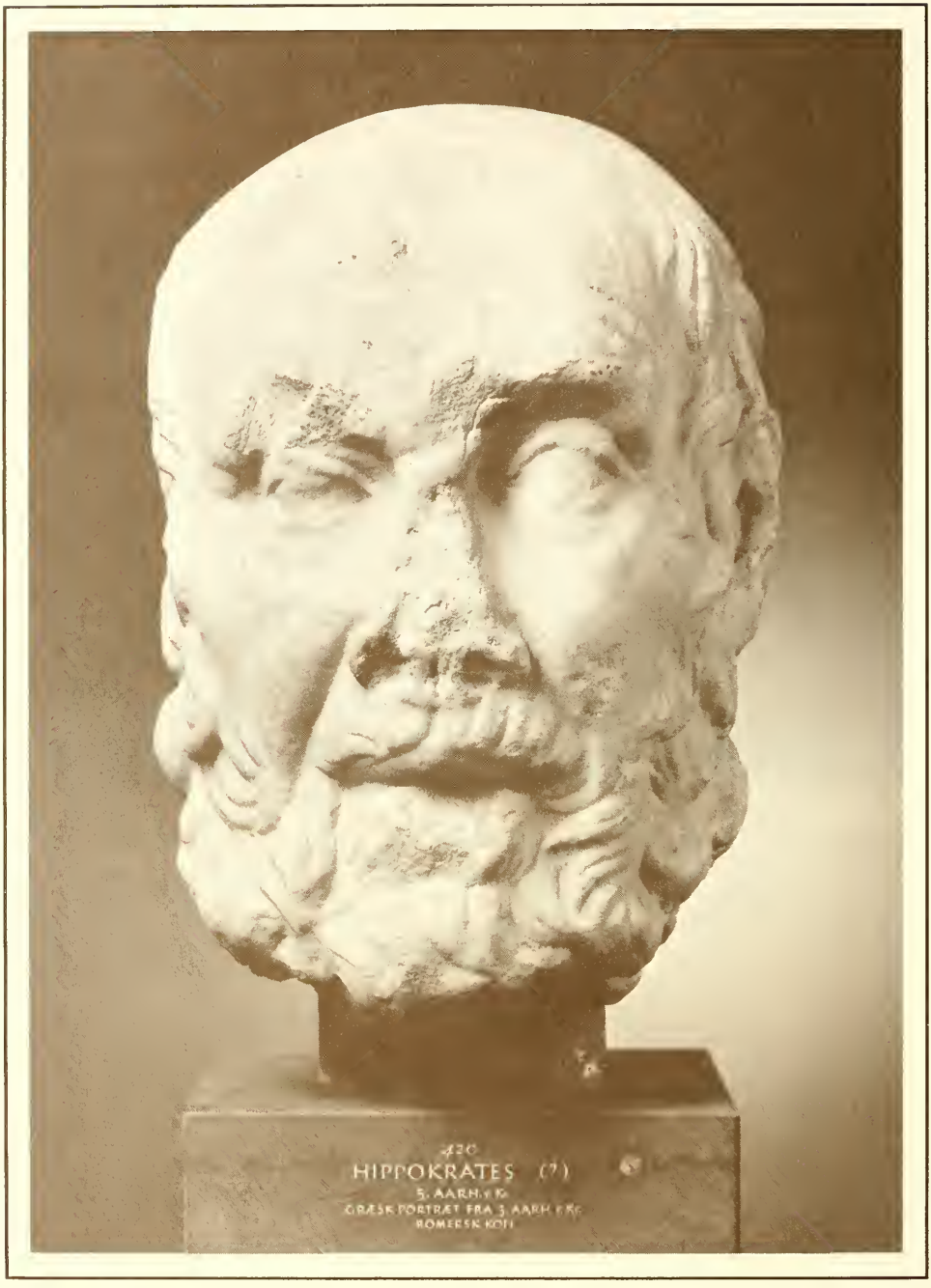
Director:	Susan E. Cronenwett
Location:	Foundation of the American Academy of Ophthalmology 655 Beach Street, corner of Beach St. and Hyde St., 3rd floor, San Francisco, CA 94109-1336
Telephone:	(415) 561-8500
Open:	Monday through Friday, closed holidays and weekends.
Hours:	8:30 A.M. - 5:00 P.M.
Admission:	Free
Access:	On-street meter parking. End of Powell/Hyde Cable Car and #32 bus line. Paid parking in building, entrance on Beach Street. Handicapped accessible.

AUTHOR

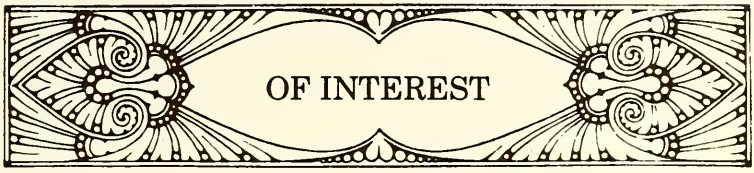
Susan Cronenwett is Director of the Ophthalmic Heritage Department and has been working for the Foundation of the American Academy of Ophthalmology since 1984. She received her bachelor's degree in Studio Art from Smith College in Massachusetts. During her undergraduate studies she conducted research and prepared exhibits for the Sophia Smith Collection, a woman's archives, and the Smith College Archive Collection. She has continued to pursue advanced training in management and administration of historical collections. Although relatively new to the field of medical history, she has quickly involved herself in related organizations and is dedicated to the preservation of ophthalmic history and its dissemination.


400 REMARQUES, &c.
une anſe qui, ſoutenant le globe de l'œil, empêche qu'il ne ſuive le mouvement alternatif que l'on eſt obligé de faire avec l'inſtrument pour la ſection de la partie inférieure de la cornée; d'où l'on conçoit que l'œil ainſi ſoutenu, & pour ainſi dire fixé, l'opération ſe termine sûrement & promptement, ſans qu'on ſoit obligé d'employer ſucceſſivement tant d'inſtrumens. Par cette méthode, on peut également bien opérer ſur les deux yeux avec la main droite, en ſe plaçant à côté ou derrière la tête du malade.
Si après la ſection de la cornée, qui doit être environ des deux tiers, une légère compreſſion du globe ne ſuffiſoit pas pour faire ſortir le cryſtallin, on ſoulèveroit encore la cornée avec le même fil, ſans être obligé d'employer l'inſtrument de M. Daviel (Fig. f), pour la maintenir dans cette poſition pendant que l'on inciſeroit avec la pointe du même inſtrument, la membrane qui le recouvre.
Cet inſtrument eſſayé ſur les cadavres a paru ſingulièrement bon. M. Morand a offert de produire des ſujets pour l'employer ſur le vivant; on eſſaiera auſſi celui de M. la Faye, & l'on ſera plus en état de juger de leur mérite.
Fig. 1
Fig. 2
Fig. 3

1787 edition of Memories de L'Academie Royale de Chirugie, *edited by M. Louis, Paris. This book contains the reprint of Daviel's landmark description of the first planned cataract extraction in 1747, first published in 1753. Gift of William B. Glew, M.D., to the Museum of Ophthalmology. (Photo courtesy of Ophthalmic Heritage Department, Foundation of the American Academy of Ophthalmology.)*



Greek bust of Hippocrates, 5th century B.C. (Photo courtesy Ny Carlsberg Glyptotek,Copenhagen.)



Hippocrates: The Ideal Physician Then and Now

Joseph M. Merrill

Because I have a Swedish wife, I sometimes find myself in Copenhagen with spare time on my hands. After learning that the Ny Carlsberg Glyptotek has a head of Hippocrates, I went to visit him in the summer of 1984. He now resides at number 420 in room 10. His appearance astonished me: his right eyelid was drooping and his lower lid ectropic.

I took some photographs and returned to the States, and asked a number of medical specialists what they thought this ocular abnormality might be. Since they were uniformly reluctant to commit themselves, I sought a Danish consultation. Professor O.B. Paulson, Chairman of the Department of Neurology at Copenhagen's Rigshospitalet University Hospital, agreed to examine the head and gave this opinion:

> I have recently been at the Ny Carlsberg Glyptotek to see the marble head of Hippocrates. I quite agree with you; there is a striking asymmetry in this ancient marble head. I did not see any significant asymmetry in other statues. The asymmetry is so marked and the statue so well formed by the artist, that it cannot be a coincidence. But what disease or deformity does it represent?
>
> Concerning the medical opinion, I think we should first realize that the upper forehead and the lower face are quite symmetrical with symmetrical wrinkles. The difference on the two sides is thus just around the eyes. The most significant finding in my opinion is that the whole right eyebrow is displaced at least 1 cm downward com-

pared to the left side. The exact magnitude of this displacement is difficult to evaluate since part of the right eyebrow is broken off. In addition to this downward displacement of the right eyebrow, the eye is pushed downward and also slightly outward. In my opinion there is no ptosis, and the appearance of the hanging right-sided eyelid seems just to be due to the displacement of the right eyebrow and eye. I quite agree that there is a slight ectropion of the right lower lid, but this might be secondary.

Concerning the diagnosis, I find it difficult. I do not think that there is any palsy or neurological disease, but rather a disease of the bony structures or in the orbit. The downward displacement could be the consequences of a previous zygomatic fracture, but in that case I would not expect that the right eye should be displaced slightly forward. Another possibility one might assume is a space-occupying lesion in the upper orbit on the right side or a pathological growth of the structures corresponding to the upper orbit on the right side or a pathological growth of the structures corresponding to the upper orbit and eyebrow.

I hope these opinions may be of some help to you and I am looking forward to hearing what results your studies will bring.[1]

With Professor Paulson's letter and my photographs, Dr. D.B. Jones, Chairman of the Department of Opthalmology at Baylor, presented Hippocrates' case together with those of four living patients with orbital disease at Baylor's Ophthalmology Grand Rounds on April 29, 1988. He summarized the results of the case presentations and discussion as follows:

Despite the availability of the results of complete ophthalmological examinations, CT scans, other laboratory studies, and even orbital biopsies, a consensus could not be reached on the diagnosis of the four living cases. With regard to Hippocrates' abnormality, as depicted in the photographs of the head, inferoplacement of the right eyebrow, lids, and globe renders unlikely the possibility of an intraorbital tumor, a tumor of the orbital wall, or fibrous dysplasia. Developmental facial asymmetry was considered but was also judged improbable. The general opinion was that Hippocrates' deformity was most likely caused by some type of trauma. Everyone agreed that Hippocrates needs a good ophthalmological examination and CT scan![2]

Because the medical experts were unable to pinpoint the etiology of Hippocrates' physical abnormality, I explored other disciplines to better understand this apparently unique interpretation of the Father of Medicine.

The Ny Carlsberg Glyptotek very kindly sent copies of the original correspondence that led to its acquisition of the head. At the beginning of this century, Paul Arndt, a Munich art dealer, was assisting Carl Jacobsen in spending part of his Carlsberg brewery fortune to develop a first-rate collection of ancient classical art in Copenhagen. In a letter dated July 11, 1900, Arndt noted: "I am further looking at a very good Greek head, called Kameades in Naples and Florence, where there are replicas . . . ."[3] A follow-up letter, dated November 11, 1900, contains this recommendation:"Furthermore, I own three heads that I would be pleased for you to purchase . . . . [One of these is the] Head of Hippocrates'. . . [of which there are] replicas in Naples [there called Kameades] and in Florence--My specimen is the best. I ask 1200 francs. I believe this price is not too high and hope the piece finds your approval . . . ."[4] Jacobsen agreed, and the head was purchased for the Carlsberg collection.

For novices in classical sculpture such as myself, the definitive work on Greek heads is Richter's three-volume tome. Richter describes in some detail the hypothetical portraits of Hippocrates in the Ostia, Vatican, Uffizi, Naples and Copenhagen museums. Because the Ostia bust came from a tomb erected by a physician at the end of the first century A.D., it has attracted considerable attention in medical circles. A pedestal found close by is thought to match the bust and is inscribed thus: "Short is life, but long is the time that we mortals spend beneath the earth after death." The beginning of this inscription resembles Hippocrates' most famous aphorism: "Life is short, and art is long, opportunity is fleeting, experience precarious, and judgment difficult." The pedestal's opening words have been taken as evidence by some scholars that the bust is indeed an imaginary portrait of Hippocrates. Others have disagreed and attribute both verse and bust to either Pindar or Euripides.

Although Richter's photographs of the Copenhagen head record the abnormal eye that clearly distinguishes it from the other portraits, she nevertheless concludes that these heads were all copied from the same Greek original. If the artist who made the Copenhagen head did copy it from another one, he changed the right eye so that any observant fourth-year medical student could spot the ocular abnormality.

To determine whether symbolism might possibly have figured in the sculpting of this ocular abnormality, I asked the opinion of Professor Emily D.

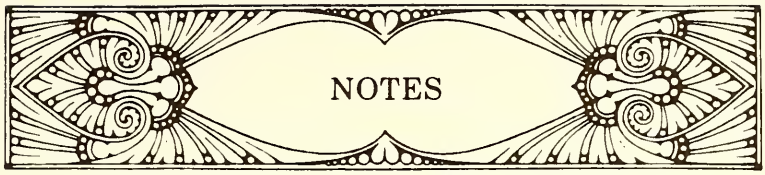
Vermeule of the Department of Classics at Harvard. She replied: "We know absolutely nothing about Hippocrates--except that he was short, and travelled a lot. There's only Plato's Phaedrus 27 c-d . . . all these portraits are literary retrospectives--and have nothing to do with the actual looks of the portrayed person . . . Perhaps, rather than symbolism, a live sitter was used."[5]

Two contemporary sculptors, Alan Lequire and Rose Van Vranken, have examined the photographs and agree with Professor Vermeule's suggestion that the sculptor "did it as he saw it." Professor Brunilde Ridgway, archeologist in classical studies at Bryn Mawr, pointed out that the artist would not necessarily have used an actual sitter posing but his inspiration may have come from what he saw in real life.[6] She noted that scars, blemishes, and paresis secondary to strokes are all present in Late Republican and Trajanic portraits and were often added by Roman copyists to suit their own purpose.

If only a few fragments exist to indicate that a man named Hippocrates actually lived 2,000 years ago, why then does he continue to be important to physicians? A 1983 study showed that a majority of physicians opposed revising the Hippocratic Oath.[7] Furthermore, those physicians who supported the oath's current version most strongly were the same ones who espoused the traditional doctor-patient relationship. To give meaning to their professional lives, physicians' collective medical psyches have created and sustained a mythical Hippocrates as a model for the ideal healer.

In her summary of the Hippocrates portraits, Richter concludes: "The general impression of the . . . sculptured heads is . . . that of an urbane, sympathetic individual of high intelligence and capable of intense concentration."[8] If the Greeks and Romans visualized their ideal physician thusly two millenia ago, is contemporary medicine's preoccupation with bio-technology shortchanging both our patients and ourselves?

I thank the staff of the Ny Carlsberg Glyptotek, particularly Jette Christiansen and Karen Slej, for their assistance; Oke Woldbye for the photographs; my professional colleagues, Professors Dan Jones and O.B. Paulson for their medical opinions; and lastly, Professor L. Birnbaumer for his translation of Arndt's letters.



1. Personal correspondence from Professor Olaf B. Paulson, dated October 13, 1986.

2. Personal correspondence from Professor D. B. Jones, dated May 6, 1988.

3. Personal correspondence from Paul Arndt to Carl Jacobsen, dated July 11, 1900.

4. Personal correspondence from Paul Arndt to Carl Jacobsen, dated November 11, 1900.

5. Personal correspondence from Professor Emily D. Vermeule, dated November 14, 1984.

6. Personal correspondence from Professor Brunilde Sismondo Ridgway, dated October 25, 1988.

7. Joseph M. Merrill, Lila Laux and John I. Thornby, "Troublesome Aspects of the Physician-Patient Relationship: A Study of Human Factors," *Southern Medical Journal 81* (1987):1211-1215.

8. G.M.A. Richter, *Portraits of the Greeks* (London: Phaidon Press, Ltd., 1965), 151-154.

Joseph M. Merrill, M.D., was graduated from Harvard Medical School in 1948. His internship and residency in medicine were at Vanderbilt University Hospital from 1949 until 1951. Dr. Merrill took a research residency at the Veterans' Administration Hospital in Nashville from 1954-1955, and then assumed the titles of Chief of Clinical Physiology and Assistant Chief of the Radioisotope Service at that same institution from 1956-1964. He left Nashville to accept the position of Chief, General Clinical Research Centers Branch of the National Institutes of Health, where he remained until 1967.

Moving to Houston, Dr. Merrill was appointed Dean of Scientific Affairs at Baylor College of Medicine. He served as Executive Vice President of Baylor from 1970 until 1978. He currently is a Professor of Community Medicine at Baylor, and has been a consultant at St. Luke's Episcopal Hospital and the Harris County Hospital District since 1967. Dr. Merrill has taken two university sabbaticals, one at the University of London and the other at Harvard University. These intervals have provided time to explore various aspects of the humanities as they relate to medicine. His interest in history and art in medicine stems from his secondary education in the public schools of Andalusia, Alabama.

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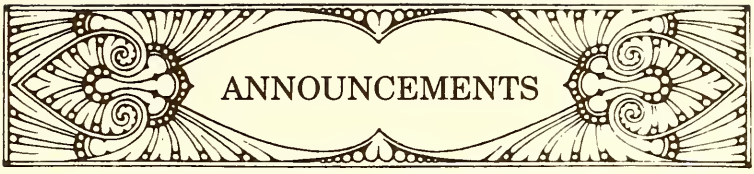

The American Association for the History of Medicine (AAHM) will hold its annual conference in Birmingham, Alabama from Thursday, April 27 through Sunday, April 30, 1989. Registration is $50.00 for members and $60.00 for non-members before the April 13 pre-registration deadline.

The host hotel is the Birmingham Hilton (808 South 20th Street, Birmingham, Alabama, 35205. 205/933-9000). There is a guaranteed rate of $58.00 per night for AAHM registrants. Among the interesting sidetrips are the Alabama Museum of Health Sciences, the Birmingham Art Museum and its renowned Reynolds Collection, and the Jefferson County Medical Society and Archives. Contact Mary McCarl (205)933-8601 for details.

Concurrent with AAHM is the annual meeting of the Medical Museums Association (MeMA), to be held Saturday, April 29. A luncheon and program are planned. Contact Jim Edmonson (216)368-3648 for information.

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